# NWRWAVES
## (NOAA Weather Radio With All-Hazards VTEC Enhanced Software)

## Installation and Configuration Documentation

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|---|---|
| **Version** | v2.4 (OB6 final baseline release) |
| **Programming Language** | Tcl/Tk |
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## 1.    INTRODUCTION

NWRWAVES is a comprehensive formatter for NOAA Weather Radio (NWR) products. Its purpose is three fold. First, it is designed to replace all existing formatter capabilities found in the AWIPS WWA program and also the capabilities found in CAFÉ. Second, NWRWAVES utilizes VTEC coding found in an increasing suite of NWS products to better identify, produce and manage outbound CRS Weather Messages. The use of the Message Reference Descriptor (MRD) number will allow sites to better automate their CRS Broadcast Cycle management. Third, NWRWAVES is designed for better sustainability over the numerous scripts used in the CAFÉ approach.

As a new site preparing to use NWRWAVES, there are three basic steps necessary to configure the software for your local area. The first step is installing the software. If you are receiving NWRWAVES as part of your OB6 – Phase 3 load, then Section 2 can be skipped as NWRWAVES will be loaded for you automatically in OB6. Once the software is loaded, there are three major steps needed to configure and run NWRWAVES:

A)    The first is to configure your local settings in NWRWAVES. These include your transmitters or broadcast programs, the products that can be processed through NWRWAVES, summary message settings and marine/tropical product settings. NWRWAVES has powerful local configuration tools for product-by-product settings, adding local Listening Area Codes (LACs) and local products, and a customizable word/phrase replacement capability (similar to CAFÉ). Instructions on how to configure these settings can be found in **Section 3 – NWRWAVES SETUP UTILITY**.

B)    The second step is to establish product triggers from the AWIPS database, to send products through NWRWAVES. NWRWAVES does feature a test mode, and the new formatter program will be run in the beginning in conjunction with existing CAFÉ formatters to facilitate side-by-side comparisons of output prior to formal activation (by product) of NWRWAVES. Instructions on how to establish database triggers are located in **Section 4 – SETTING AWIPS TEXT DATABASE TRIGGERS**.

C)    The third step (and a necessary one before you transition NWRWAVES to operational mode) is to ensure that your CRS database is structured to accept inbound Weather Messages from NWRWAVES. NWRWAVES uses an approach where each transmitter/broadcast program receives a unique Message Type naming scheme. An

explanation of how NWRWAVES generates Weather Messages, along with suggestions on an approach to the structure of the local CRS database, is located in **Section 5 – NWRWAVES AND YOUR CRS DATABASE**.

## 2. INITIAL INSTALLATION OF NWRWAVES

As of 11/7/05, the latest version of NWRWAVES will be v2.4 (the baseline version for AWIPS OB6). **NOTE**: the only configuration difference between v2.3b and v2.4 is that in v2.4, a flag setting was added on the 'Marine' tab of the Product Configuration (**Section 3 – Tab 4**) to turn on/off VTEC usage in marine products. Sites that receive NWRWAVES as part of their O6 – Phase 3 installation will receive this version on their OB6 DVD. If you are accepting NWRWAVES with OB6 – Phase 3 installation, you can skip directly to step (M) below in Section 2. For sites that are installing NWRWAVES prior to OB6 – Phase 3, you will need to complete the following steps:

A. Log into an AWIPS LX workstation with a user account that has fxalpha group privileges and open up a terminal window

B. Log onto DX1

   **ssh dx1**

C. Change to user root

   **su – root**

D. Copy the program source file **fullNWRWAVES.tar.gz** into the /tmp directory

E. Change directories to the /tmp directory

   **cd /tmp**

F. Extract the gzipped tar file

   **gunzip -c fullNWRWAVES.tar.gz | tar xvf -**

G. Make sure install script is executable

   **chmod 755 installNWRWAVES.s**h

H. Start a log file of the installation

   **script –a /tmp/NWRWAVES_install.log**

I. Run the install script

   **./installNWRWAVES.sh**

**NOTE:** if you have a previous version of NWRWAVES loaded on your AWIPS, you will be prompted as to whether you wish to back up your current version before installing the new one. If you answer 'Yes', the install script will back the version you have up to the directory /awips/adapt/NWRWAVES-SAVED/NWRWAVES-mmddyy-hhmm, where "mmddyy" is the current date and "hhmm" is the hour and minute. You can then restore to a previous version (if needed) from this backup location. If you install multiple versions of NWRWAVES, the ITO or AWIPS focal point may want to clean out old backup directories.

J.   When the script is completed type

**exit**

to terminate logging

K.   Review the log file for any errors.

**more /tmp/NWRWAVES_install.log**

L.   NWRWAVES is now installed on your AWIPS. The root directory for NWRWAVES is "/awips/adapt/NWRWAVES". Appendix A contains a list of all file names and directories that are located under this directory.

M.   Before you begin to configure NWRWAVES, you must first grant permission for users in your office to access the NWRWAVES Setup Utility. In the /awips/adapt/NWRWAVES/browser directory, there is a file called "admin.list". You will need to edit this file and add any AWIPS user accounts that you want to have access to the setup utility. All other users will be blocked.

To edit this file from any AWIPS workstation:

-   Open a shell with a user account that has fxalpha group privileges. In this shell, change directories into the NWRWAVES Browser directory:

**cd /awips/adapt/NWRWAVES/browser**

-   Edit the "admin.list" file:

**nedit admin.list**

-   Add your local AWIPS user accounts as needed, and delete any existing entries from the default list. Make sure there is only one user account on each line.

-   When you are done, save the file and then exit from the editor. Exit from the shell.

You are now ready to run the NWRWAVES setup utility. This utility will allow you to configure NWRWAVES for your local site.

### 3. NWRWAVES SETUP UTILITY

The next two steps require that you are an AWIPS user whose AWIPS user account is listed in the "admin.list" file as described above.

A)    Open the NWRBrowser on any AWIPS workstation.  You will be greeted by the new NWRWAVES Browser (Figure 1).
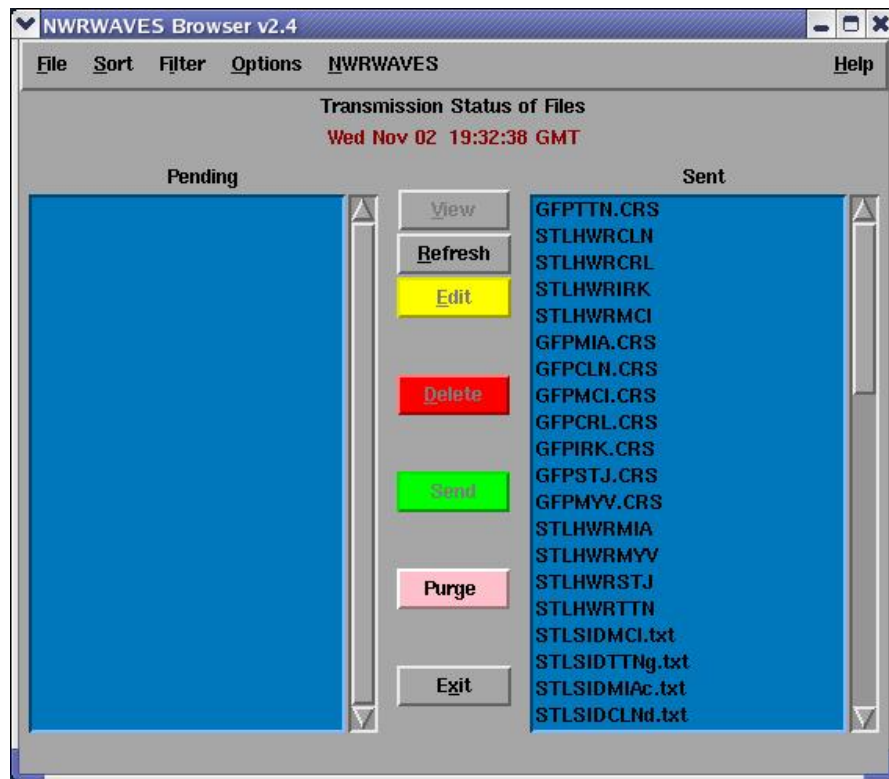


**Figure 1 – NWRWAVES Browser**

The NWRWAVES Browser replaces the baseline NWR Browser in AWIPS.  Its functionality mirrors that of the NWR Browser, and there are also added capabilities.  Details on NWRWAVES Browser operation can be found in **Section 6 – NWRWAVES OPERATION**.

B)    From the "NWRWAVES" pull-down menu, select the option "NWRWAVES Setup".  You will see the NWRWAVES Setup GUI pop-up on your AWIPS screen (Figure 2).   The initial display will start on the first of four tabs, which is the transmitter/broadcast program configuration tab

NOTE: If you get an error message that a version is already open somewhere else, but you are confident that there is not a version open anywhere on your AWIPS, perform the following steps:

-        Open a shell on any AWIPS workstation as a user with 'fxalpha' group privliges.
-        Type **cd /awips/adapt/NWRWAVES**
-        Type **rm –f setup.lock**
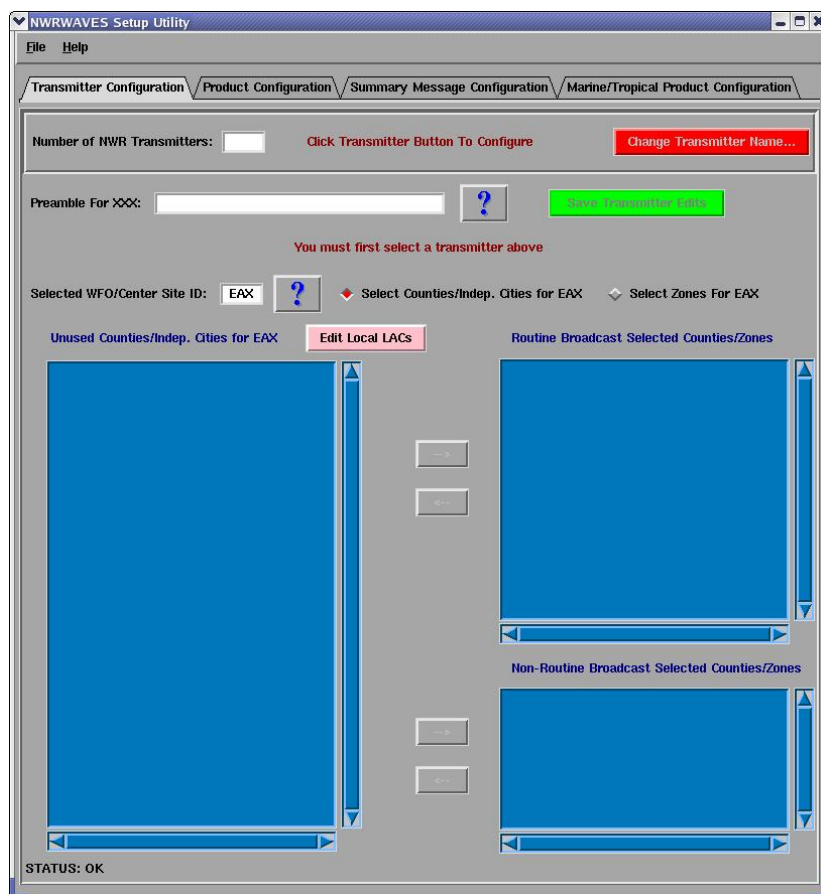-        Exit from the shell

**Figure 2 – NWRWAVES Setup GUI**

There are four tabs on the NWRWAVES Setup GUI. Each one governs a unique section of NWRWAVES configuration. You can cycle to each one by simply clicking on the tab label located at the top of the interface. There is a pull-down menu, "File", which will allow you to 'Save and Exit' or simply 'EXIT WITHOUT SAVING' the program. The "Help" pull-down menu contains information on the product version.

On each tab, there are buttons labeled with question marks. Each of these buttons contains information on what you need to do for that particular configuration item. Be sure to make liberal use of these question boxes for hints and help.

**NOTE**: When you make adjustments to NWRWAVES configuration data, the current version of your configuration files are saved off into the /awips/adapt/NWRWAVES/BACKUP directory. Details on these file names are in the different 'Tab' sections below. When they are saved off into the /BACKUP directory, the naming scheme used is the file name, followed by a date/time stamp. This will allow you to quickly restore from any mistakes made in configuring different components of NWRWAVES.

To configure NWRWAVES, you will work from left to right on these tabs to establish your office configuration. The first tab is our first tab – establishing your transmitter information.

# Tab 1 – Transmitter Configuration

To configure your transmitter (broadcast program) information, complete the following steps:

1) At the top of the interface there is a box for you to enter the number of transmitters (number of broadcast programs) you have in your office. Left click in this box, enter in the number of transmitters in your CWA and press the "Enter" key. NWRWAVES will create a list of transmitters (over several rows) for your use. By default, the names of these transmitters will be a default ID of *NWx* (where x is 1 to the number of transmitters). For transmitters over 10, the naming scheme is *Nxx*.

2) Select a transmitter by clicking on the radio button by its label "**NWx**" with the left mouse button. For the first transmitter, this will be the one labeled "NW1".

3) Click the "**Change Transmitter Name**" button to set a 3-letter ID for that transmitter. NOTE: the 3-letter ID will be used to create the PIL when generating CRS messages (a transmitter called MCI would produce products like STLNOWMCI, STLSVAMCI, etc). The first three letters of the CRS message is your legacy state AFOS identifier. **NOTE:** be sure to make note of the three letter mnemonic used for each transmitter. This will be important as the naming scheme must match how your CRS database is configured (see **Section 5** for information on CRS Database configuration).

4) If you desire to assign a preamble phrase for your transmitter, enter in a preamble for that transmitter (if desired) in the appropriate box. *NOTE: clicking on the "?" button located past the "Preamble For XXX" data entry box provides a good example of preamble text.*

5) Repeat steps 2 through 4 for each transmitter. Each transmitter must have a unique three letter mnemonic, and this three letter mnemonic will be used for the creation of unique Weather Messages for each transmitter. The preamble phrase is strictly optional.

The next step is to create the list of counties (parishes)/independent cities, and public zones/marine zones/fire weather zones which represent the service area for each transmitter.

6) Click on the radio button representing the first transmitter. Left-click in the box to the right of the label "Selected WFO/Center Site ID". Your office ID should default as the entry for this box. If it is missing for any reason, enter in your office's three letter identifier into this box, then hit the 'Enter' key.

7) You will see a list of county/parish/independent cities appear in the left hand column. There are two radio buttons next to the box you entered your site ID into in (6) above. The default radio button set is "Select Counties/Independent Cities for XXX", where "XXX" is your site ID. You will assign county (FIPS) codes and zone (Z) codes separately for each transmitter. This will allow maximum flexibility for unique circumstances in managing your service area.

8) The list of county (parish)/independent cities and zones is kept in a default distribution file in the /awips/adapt/NWRWAVES/bin directory and is called "UGClookup.table". This file was derived from AWIPS shape files and is as complete as possible. Sites will not modify the UGClookup.table file! If you note errors in the names of your counties (parishes) or zones, please post them to the NWRWAVES listserver, so they can be fixed in the baseline file and re-distributed in the next AWIPS build upgrade. Sites with marine zones may want to pay close attention, as some of the marine zone names are somewhat verbose in the default file.

Your transmitter configuration tab will initialize with your WFO identifier's list of counties (parishes)/zones.

There may be instances where a county/zone is missing, or where your office uses a local "dummy" county or zone code on your transmitters.  You can add any missing or custom listening area Codes (LAC's) into NWRWAVES.  Likewise, you can also edit or delete any existing local LAC's.  To do this:

a)	Click on the pink button labeled, "Edit Local LAC".
b)	A pop-up GUI will appear, and you will be prompted to enter data into it (Figure 2a).



**Figure 2a – Add a local listening area code (LAC)**

c)	From left to right, enter the associated WFO (likely yours), the six-character UGC code (i.e., MOC998, KSZ999), the name of your new LAC (i.e., Generic County), a two-letter state ID (i.e., KS) and the time zone of this new LAC.

For the time zone, the primary option is a capital letter for the appropriate time zone (**E**-Eastern, **C**-Central, **M**-Mountain, **P**-Pacific, **A**-Alaskan, **H**-Hawaiian, **G**-Guam, **V**-Virgin Islands/Atlantic Time).  If an LAC doesn't observe Daylight Savings Time, use a lower case letter from the ones listed above in lieu of the capital letter. For example, an entry of "**c**" represents that this LAC observes Central Time and does not observe Daylight Time.

If an LAC is large enough to encompass two time zones, the use of a two-letter code is appropriate. For example, "**eC**" would be used for an LAC that covers part of the Eastern Time zone that doesn't observe DST, but also one that covers part of an area in the Central Time zone that does observe DST).

If you enter the same data as an existing local LAC, you will see the buttons for '**Save Edits**' and '**Delete**' become usable.  If the data is new, you will only be given the option to '**Add LAC**'.

d)	Click the appropriate button for the action needed when you have finished entering in your local LAC.

Repeat step 8 as necessary to add all local FIPS and zone codes for this transmitter.  Any local LAC's will be added into the /awips/adapt/NWRWAVES/bin directory in the file "localUGClookup.table".

9)	To select counties (zones) for inclusion in a transmitter's service area, left-click on any applicable county names in the left blue list box.  This list will include all baseline counties (zones) as well as any local entries you have entered.  You can select multiple counties all at once simply by clicking on the county names (there is no need to hold the "SHIFT" or "CTRL" buttons to multi-select counties).  Once you have them selected, you can assign them to either the Routine Broadcast Service Area (BSA) or the Non-

Routine Broadcast Service Area (NBSA) by clicking the appropriate → button.   Likewise, you can remove counties back to the master list by highlighting them in the right blue list boxes and clicking the ← button.

**SPECIAL NOTES ABOUT ROUTINE VS. NON-ROUTINE BSA'S (and how they relate to legacy CAFÉ scripts):**
Each transmitter has a separate list for Routine Counties/Zones and Non-Routine Counties/Zones.  In the context of NWRWAVES, this is **not** necessarily a one-to-one relationship with the routine service area of your CRS transmitters.

You can use the separate lists in two distinct fashions:

a) One method is to establish your lists by using any county/zone for which you routinely broadcast information (tone alerts for warnings, etc.) in your Routine BSA.  Users would then include county/zone entries that reside outside a normal reception area in the Non-Routine BSA.  This is useful as you can include counties in your Non-Routine BSA for which you do unique tone-alert settings by product, counties that are  out of your transmitter's coverage area but for which you carry WRSAME bursts for an area radio station, or to set a county from a distant office to carry a product such as an HLS (where you are an inland office but wish to broadcast information about a land falling tropical system from a nearby coast).

Method (A) mimics how your broadcast service area actually functions within the scope of over-the-air broadcasting.

b) The second method is to assign only a "core county/core zone" to your Routine BSA, then assign all other county/zone entries into your Non-Routine BSA.  This setup allows you to mimic legacy CAFÉ behavior in multi-segment, non-VTEC coded products such as the ZFP, NOW, SPS, and HWO. Later in the setup process, when you configure NWRWAVES products by AWIPS product identifier and/or VTEC code, you would set such products as the ZFP/NOW et. al. to not process for the Non-Routine BSA, and set all other products like watches/warnings, etc., to process for both lists.  This enables you to use a core-county approach which results in just one segment slated for airplay on CRS.

Method (B) mimics legacy "core county" functionality of the ZFP and NOWX CAFÉ formatters.

Once you have selected all the counties within your CWA, you can select county/counties from other CWA's if your transmitter overlaps another office's CWA.  To do this, go back to step (6), and change the office ID from yours to the other office, then hit "ENTER".  **NOTE**: to access counties (parishes)/zones from another office, type that office's 3-letter ID into the box next to the label "Select WFO/Center Site ID" to populate that office's list.  To enable a list of off-shore marine zones, type "OPC" into this box to access the off-shore zones that the Ocean Prediction Center uses for the OFF products.

10) Repeat steps 7, 8 and 9 for counties from that office.  Repeat step (10) for all offices that affect the service area of this transmitter.
11) Once you have assigned the county (parish)/independent cities for this transmitter, click on the radio button labeled "Select Zones for XXX'.   This will allow you to assign the "Z" codes for this transmitter.

12) Repeat steps (6) through (10) to select all zones applicable to this transmitter. The zone listings are inclusive to all forecast, marine and fire weather zones.
13) Click the green "Save Transmitter Edits" button to save off the configuration data for this transmitter.
14) Left-click on the radio button for the next transmitter in your configuration list.
15) Repeat steps (6) through (13) for this transmitter. Repeat steps (14) and (15) for all remaining transmitters.

Once you complete these steps, you will have selected county (parish)/independent cities and zones listings for all of your transmitters. Each transmitter will have a unique three-letter mnemonic, and (if applicable), you will have assigned each transmitter with a preamble phrase.

The transmitter configuration settings are stored in the /awips/adapt/NWRWAVES directory in the file "**transmitter_cfg.XXX**", where 'XXX' is your AWIPS site identifier. **You should not hand-edit this file!** Any changes required must be made through the NWRWAVES Setup GUI.

Once you have configured the transmitters, your "Transmitter Configuration" tab should look similar in format to Figure (3). The next step is to configure products for processing through NWRWAVES.
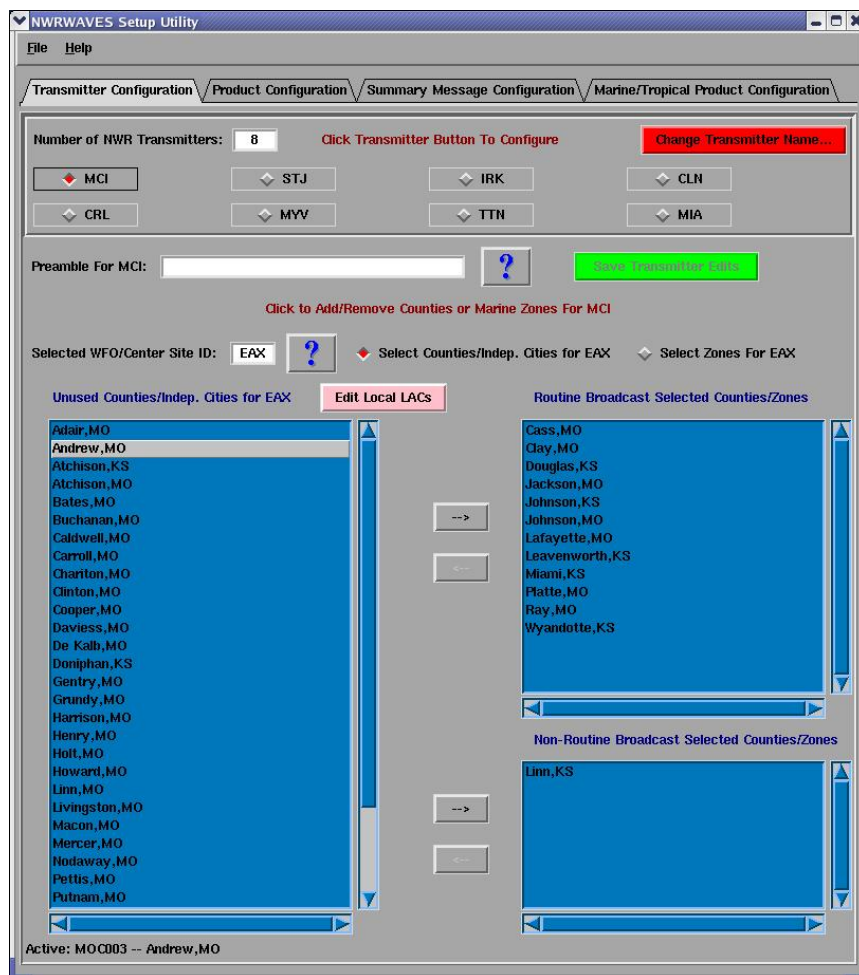


**Figure 3 – an example of a complete Transmitter Configuration tab**

# Tab 2 – Product Configuration

After you are done configuring your transmitters, click the **Product Configuration** tab (Figure 4)
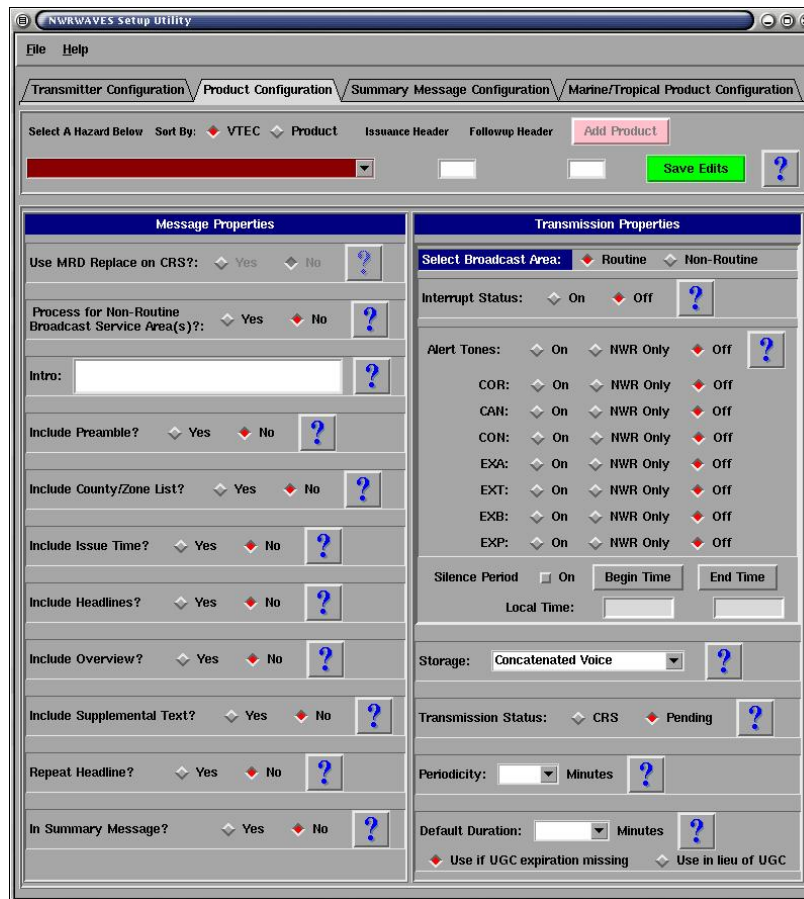


**Figure 4 – Product configuration GUI**

This tab is used to set all the configuration items for each NWRWAVES product type.  Those used to WWA or CAFÉ formatters should note some similarities, but many new features will also allow for extensive customization of CRS messages.

In the top left corner you will see a red pull-down menu which contains a list of all of the baseline product types that can be formatted to CRS using this software.  The list is arranged alphabetically by a leading three letter identifier.  Some of these products have a period in them (i.e., **SV.W**) which indicates a VTEC product code.  Others do not (i.e., **LEW**) which indicate a non-VTEC product.

VTEC products listed do not at times correspond directly to their AWIPS product identifier (i.e., HS.W is issued in AWIPS as a WSW).  *When you think about products and configuring them for NWRWAVES, think of them in terms of their VTEC code and not their AWIPS product identifier.*  There are legacy AWIPS product identifiers in the product configuration list (i.e., **SV.W** is there for a Severe Thunderstorm Warning, and **SVR** is also listed as a Severe Thunderstorm Warning).  NWRWAVES will use the VTEC phenomena and significance codes as its primary lookup, so the entry for SVR is redundant and only used if for any reason the VTEC line was corrupt or missing from a Severe Thunderstorm Warning.

Both product types (VTEC and non-VTEC) share many common configuration settings. VTEC products have additional unique configuration settings for alert tone settings, based on the VTEC action code. VTEC products are also tracked internally by NWRWAVES, and the advanced feature of MRD Replace is used to facilitate better automation of information replacement in the CRS Broadcast Cycle. **In the NWRWAVES distribution file, all these configuration settings are set to "No" and the product dissemination is set to the "Pending" side of the NWRWAVES Browser (as they are shown in Figure 4 above).** Sites will need to adjust these settings *by product* to meet their local needs.

**SPECIAL NOTES FOR CONVECTIVE SHORT-FUSE WATCHES AND WARNINGS:**
In the VTEC sense, a tornado watch is defined as a TO.A, a severe thunderstorm watch a SV.A, a tornado warning as a TO.W, and a severe thunderstorm warning as an SV.W. When you begin to configure products in NWRWAVES, you must think of these products as their VTEC hazard, and not their AWIPS product. For example, you would configure all options for tornado warnings under the "TO.W" option in the product list in NWRWAVES. If you wish to have the follow-up SVS statement's headlines read, you will need to turn the "Include Headlines" option to "On" under the "TO.W". Why? The AWIPS product does come out as an SVS, but it has the "TO.W" VTEC code in it, which is what NWRWAVES will use to determine what to do with the inbound tornado warning follow-up.

There are legacy AWIPS product identifiers in the NWRWAVES product list, just in case a product is inadvertently sent without VTEC coding. You should also configure these just in case.

VTEC coded short fuse watch and warning products are as follows:
*SV.A – Severe Thunderstorm Watch*
*TO.A – Tornado Watch*
*TO.W – Tornado Warning*
*SV.W – Severe Thunderstorm Warning*

**SPECIAL NOTES FOR SITES WITH MARINE RESPONSIBILITIES:**
Marine products such as the Near Shore Forecast (NSF) and Coastal Waters Forecast (CWF) (and soon by directive to include the Offshore Forecast (OFF) and Great Lakes Forecast (GLF)) have numerous VTEC possibilities. You have the option in NWRWAVES to enable/disable VTEC use for these products (settings are established in Section 3 – Tab 4 below), as VTEC can lead to some complicated processing of segments and messages on the air.

If you decide to have NWRWAVES track VTEC, you will need to configure NWRWAVES for each of these VTEC event and significance codes (each is considered a unique product). You will be able to tone alert (by VTEC phenomenon). You will not be able to set a default under the NWRWAVES product types of NSH and CWF (as appropriate) and see the products process. These VTEC event codes are as follows:

*CF.A – Coastal Flood Watch*
*CF.S – Coastal Flood Statement*
*CF.W – Coastal Flood Warning*
*CF.Y – Coastal Flood Advisory*
*GL.W – Gale Warning*
*HF.W – Hurricane Force Wind Warning*
*LO.Y – Low Water Advisory*

*LS.A – Lakeshore Flood Watch*
*LS.W – Lakeshore Flood Warning*
*LS.S – Lakeshore Flood Statement*
*LS.Y – Lakeshore Flood Advisory*
*MA.F – Routine Marine Forecast*
*MA.S – Special Marine Statement*
*MA.W – Special Marine Warning*
*RB.Y – Small Craft Advisory for Rough Bar*
*SC.Y – Small Craft Advisory*
*SE.Y – Hazardous Seas Advisory*
*SI.Y – Small Craft Advisory for Wind*
*SR.W – Storm Warning*
*SU.W – High Surf Warning*
*SU.Y – High Surf Advisory*
*SW.Y – Small Craft Advisory for Hazardous Seas*
*TS.A – Tsunami Watch*
*TS.W – Tsunami Warning*

*If you disable VTEC tracking for these marine products, NWRWAVES will treat them as non-VTEC products, and the settings under the NWRWAVES product types of "NSH" and "CWF" (also "OFF" and "GLF") will be used universally regardless of the VTEC hazards contained in each segment.  You will **not** be able to assign tone alerts by VTEC phenomenon.  You would only need to configure these four NWRWAES product entries (as applicable to your office):*

*CWF – Coastal Waters Forecast*
*NSH – Near Shore Forecast*
*OFF – Offshore Waters Forecast*
*GLF – Great Lakes Forecast*

To begin modifying product parameters:

1)  Select a product from the drop down menu. (**NOTE**: these items can be arranged alphabetically by VTEC phenomena or by product type by clicking the appropriate radio button).

2)  The settings for this particular product are displayed.

3)  Each configuration item on the GUI has a question mark box to its right.  Click on that question mark box to see more information on what that particular item governs.  Referencing Figure 4 above, here is a breakdown of the interface:

    a)  Starting to the immediate right of the product drop-down list, there are two boxes labeled "Issuance Header" and "Followup Header".  Assign the CRS product identifier (middle three letters) into these boxes.  **These entries can differ from the VTEC phenomena/significance codes or the AWIPS product identifier!**  For example, a Severe Thunderstorm Warning has a VTEC phenomena/significance code "**SV.W**", an EAS product issuance code of "**SVR**" and a follow-up code of "**SVS**".  You want to ensure that the "Issuance Header" and "Followup Header"

are consistent with EAS codes (and resultant CRS Weather Messages).  You will see this with much of your winter weather, non-precipitation and severe weather product suite.

**NOTE:** Where appropriate, the default NWRWAVES distribution file will contain EAS codes for various watch and warning as mandated by directive. Sites should not change the issuance or follow-up headers for warning or watch products without first checking the applicable directives.

Down the left-hand side of the product configuration interface, you will see yes/no selectable options for the following items labeled "**Message Properties**":

b) Use MRD Replace on CRS:  This option is grayed out (not selectable) and set to "Yes" by default for all VTEC coded products.  The option is also grayed out (non-selectable) for all non-VTEC products with the exception of those listed for exclusion from this rule in the file **/awips/adapt/NWRWAVES/NONVTECMRD.txt**.  If a three letter non-VTEC product is listed in this file, then you can choose the option of using MRD Replace for those non-VTEC products.

The content of the NONVTECMRD.txt file follows the following example:

NOW,N
SPS,Y
HWO,N

The NOW, SPS and HWO products can be configured by the local site to use non-VTEC product MRD Replace.  Only the SPS will use the MRD Replace in this configuration.  The NOW, SPS and HWO are the only products listed in the baseline distribution of NWRWAVES, due to somewhat unpredictable behavior that can occur in the absence of VTEC.

More information on what MRD replace is, and how it functions within NWRWAVES, can be found in **Section 6 – NWRWAVES OPERATION**.

c) Process for Non-Routine Broadcast Service Area(s):  If set to "No", then an inbound product/segment will not be processed if the UGC line contains only non-routine BSA counties/zones for a given transmitter. If set to "Yes", then the inbound product will be processed if it contains UGC codes found only in the non-routine BSA settings for that transmitter.  Any alarm/alert settings used will be governed by the non-routine BSA alert settings (covered later).

d) Intro:  an optional text box where you can type in an intro phrase for this product.  For example, "NOW HERE IS YOUR SHORT TERM FORECAST" could be used for the "NOW" product. The intro phrase can be used in combination with the transmitter preamble phrase (set in Section 3 above) and also with a county (parish), zone and independent city listing to create lead-ins for your CRS products. **NOTE**: you must have an Intro phrase to include the county/zone list in (f) below. Otherwise, you would not get radio-ready text from NWRWAVES for these two sections.

e) Include preamble: if set to "Yes", the preamble you defined per transmitter in Section 3 will be used as part of the lead-in for this product.  You will not want to use this option and not use the Intro or County/Zone list, as the wording would not turn out very cleanly.  An example preamble might read, "In the K I D 77 listening area".

f) Include County/Zone list:  if set to "Yes", this will return a listing of counties, parishes, independent cities or zones affected on this transmitter by this product  An example phrase might be, "for the following counties, in Missouri, Bates, Jackson and Johnson.  This also includes the following Virginia independent cities, Alexandria and Richmond." **NOTE**: this feature will only work if you define in Intro in (d) above.

g) Include Issue Time: if set to yes, the time the product was run through NWRWAVES will be included.  An example phrase would be, "Issued at 3:15 pm CDT".

If you have options (d) through (f) set to yes in these examples, an intro phrase for the Short Term Forecast (example given in d) might read as follows:

*"HERE IS YOUR SHORT TERM FORECAST, for the following counties In the K I D 77 listening area, in Missouri, Bates, Jackson and Johnson".*

h) Include Headlines:  if set to "Yes", headlines contained in the inbound product will be formatted correctly and included in the CRS product, otherwise they will be omitted. You will likely want to set this feature to "Yes" for most products that could contain headlines. **NOTE**: you may wish to disable headlines for products produced from GHG, as they duplicate the headline in the attribution statement.  This will give you two headlines on the air.

i) Include Overview: if set to "Yes", the overview section of a segmented product will be included in the final CRS product, otherwise it will be omitted. **NOTE**: in a VTEC segmented product, the overview would be included with each unique VTEC-coded segment as a CRS Weather Message. This could cause the Overview to repeat multiple times.  NWRWAVES does not create a unique CRS product for the 'Overview' section.

j) Include Supplemental Text: offices can use the "&&" delimiter to separate the main body of text from a supplemental text section in products.  If this is set to "Yes", then the CRS product will include any text below the "&&" and before the "$$" that signifies the end of the segment (product).  Otherwise, anything below the "&&" will be omitted from the CRS product.

k) Repeat Headline:  if set to "Yes", then the event headline will be repeated at the end of the text captured from the product.  If set to "No", then the hazard headline will not be repeated.  This is useful in the case of a Tornado Warning.  The resultant text added would read like this example, "Repeating, a tornado warning has been issued for Jackson County, Missouri, effective until 4:45 pm CDT." **NOTE: This functionality exists only for VTEC encoded products**

l) In Summary Message:  if set to "Yes", then this particular product (hazard) will be tracked as a summarized hazard, depending on your Summary Message settings that you establish in Tab 3

later. For now, if you wish this hazard to be summarized on your transmitters, set it to "Yes", otherwise leave it set as "No".

The right hand side of the GUI interface contains the "Transmission Properties" section of settings (Figure 4a and 4b) for both VTEC and non-VTEC products.



**Figure 4a – VTEC transmission properties**     **Figure 4b – non-VTEC transmission properties**

m) For all products, you can toggle between the settings for your routine BSA and your non-routine BSA listening areas. Click the radio button between the two to switch between them. When you are configuring your non-routine BSA settings, the background of this section will switch from grey to an aqua-blue (Figure 4c on the following page).



**Figure 4c – non-routine BSA color background**

n) For both VTEC and non-VTEC products, you can toggle 'Interrupt' status to "On" or "Off". If set to "On", all instances of this product that are sent to CRS will interrupt the routine broadcast.

For the **'Alert Tones'** setting for both product types, you have three options: "On", "NWR Only" and "Off". If set to "On", then the 1050Hz and WRSAME tones will be sent with this product. **IMPORTANT NOTE: for all short fuse watches and warnings, including Tornado Watches/Warnings, Severe Thunderstorm Watches/Warnings, and Flash Flood Warnings, leave the default settings of "On" for the "Alert Tones" option, and for the VTEC options of "EXA" and "EXB" as shown on the left-hand side of Figure 4a.** By default, for all short-fuse warning products listed in Directive 10-1710, alert tones come in NWRWAVES set to **"On"** for initial issuance, as well as for extensions in area (EXA), and extensions in both area and time (EXB).

The "Off" setting will generate no tones at all.

The "NWR Only" setting will allow you to use your CRS Message Type settings to govern whether to include just the SAME tones and/or the 1050 Hz tone (if defined under unique properties). **IMPORTANT NOTE: take special care when using the "NWR Only" option for alert tones. Unless you've specifically assigned the 1050 Hz tone \*by transmitter\* under the 'Transmitter Specific' blue button on the Message Type GUI, the "NWR Only" option will simply check for any SAME settings in your Message Type to use. If you haven't done anything special to assign the 1050 Hz tone by product, you can think of the "NWR Only" option as a 'SAME-only (if configured)" option.**

For the VTEC coded product, this setting only governs the **"NEW"** action code within the VTEC line. You can then set alert tones settings for additional VTEC action codes shown on the GUI interface. These can be quite powerful in configuring alert tones for your warning suite. For example, a "TO.W" Tornado Warning product would have the "Alert Tones" set to "On" for initial issuance. As follow-up SVS products are issued, you could set the "CON" action code to "NWR Only" (and your SVS Message Type set to WRSAME only in your CRS database) to send only SAME tones for follow-up SVS statements that continue the Tornado Warning. Your setting for "EXP" and "CAN" could be set to "No", so that no tones of any kind are sent for an expired or cancelled warning.

For non-VTEC products, the "Alert Tones" setting governs any issuance of the product (governed by AWIPS product identifier). An example of this is the **"FFW"** (non-VTEC coded product). While the follow-up product for an FFW is an FFS, **"FFS"** has its own product identifier listed in the NWRWAVES product database, therefore the alert tone settings of the FFW will not be used for the FFS. When this product becomes VTEC coded, the product identifier **"FF.W"** in the NWRWAVES product list will then be used, and the alert settings for follow-up statements will be those you assign.

o) Silence period: if this box is checked, you can override the "Alert Tones" settings for specific periods during the day. You set these by clicking on the boxes labeled "Begin Time" and "End Time". Figure 4d shows the GUI used to set these times.
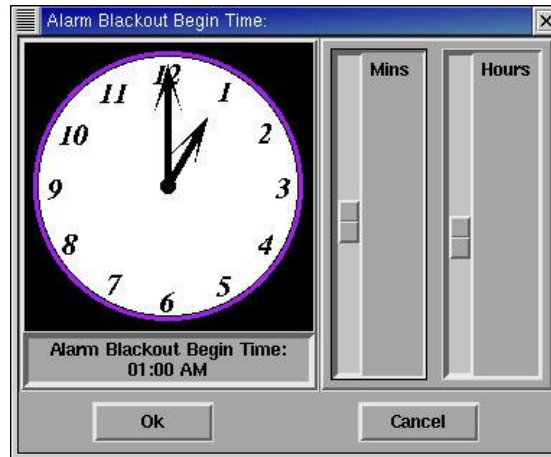
**Figure 4d – Silence period time setting**

The last section of the "Transmission Settings" GUI sets the disposition, periodicity and disposition of CRS messages (Figure 4e).
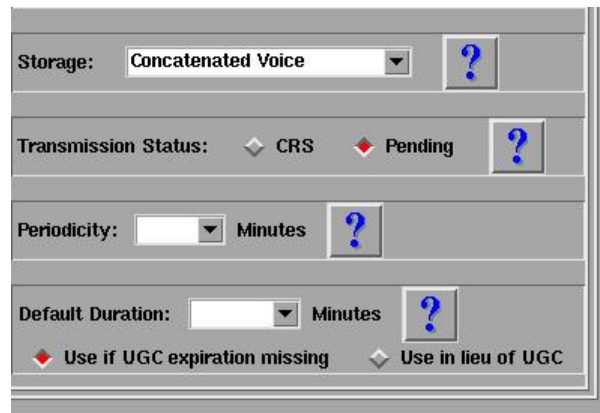


**Figure 4e – final transmission settings**

p) Storage: from the pull-down menu, you can select from 'Active', 'Inactive', 'Synthetic Speech Override', or 'Concatenated Voice (VIP)'. By default, every product in the baseline NWRWAVES distribution is set to 'Concatenated Voice (VIP)'.

q) Transmission Status: if set to 'CRS', this product will be sent directly to CRS for airplay. If set to 'Pending', resultant product will be placed in the Pending side of the NWRWAVES Browser. Every product in the NWRWAVES distribution is set to 'Pending'.

**NOTE:** Sites should leave the disposition of CRS products to 'Pending' for every product until they are ready to begin active use of NWRWAVES. At that time, products can be converted from 'Pending' to 'CRS' one-by-one to ensure a smooth transition.

r) Periodicity: you can type in a number (in minutes) or select a number from the drop-down menu, to assign to this product. If you wish to remove a periodicity setting, you can left-click in the text box next to the triangle, backspace over the number, then left-click in the gray area to reset it to a blank.

s) Default duration: you can type in a number (in minutes) or select one from the drop-down menu to set a default duration for any product that is missing a UGC line. If you have a UGC coded product but do not wish to play it for an extended time, you can click the "Use in lieu of UGC" radio button to force the default duration time no matter what the UGC expiration time is in the product.

t) When all these settings have been configured for this product, click the green "Save Edits" button at the top of the interface.

4) Repeat steps 1, 2, and 3a through 3u for every product in the drop down list that your office processes for CRS.

5) You may find that a local product issued by your office is missing from the product configuration file, or that a regional/national product is also missing. You can also add products locally to your product configuration file. In the case of the regional/national product in scope, you will want to add it but also post it as a future addition for the baseline to the NWRWAVES list server.

To add a local product to the Product Configuration list:

a) Click on the pink "Add Product" button found towards the top right of the Product Configuration tab GUI.
b) A pop-up GUI interface will display (Figure 4f). In the text boxes provided, fill in the basic information of the new product, similar to what is displayed below.



**Figure 4f – Add a new product to NWRWAVES**

c) If the product is VTEC encoded, be sure to include a period between the second and third letter of the VTEC Phenomenon or Product PIL entry. Otherwise, just enter the three letter identifier of the CRS Product PIL.

d) Click the 'OK' button once these entries are complete.

e) You will be returned to the Product Configuration Tab GUI. Complete step 3 in its entirety to finish configuration of this new product. When done, click the green "Save Edits" button to save your new product. NWRWAVES will double-check to ask if you really want to save this new product to your product configuration list.

Product configuration data is stored in /awips/adapt/NWRWAVES in the file **product.cfg**.  **Sites will not hand-edit this file!**  It is comma delineated, and there is a significant risk of messing up critical NWRWAVES configuration data by hand-editing the file.  Sites will use the NWRWAVES Setup GUI to make adjustments to product configuration. Your local product.cfg file will be restored every time you upgrade to a newer version of NWRWAVES.

## SPECIAL NOTES ON CONVECTIVE WATCH PRODUCT PREPARATION

NWRWAVES functions similarly to CAFÉ with respect to convective watch message generation.  CAFÉ would process either the WOU or WCN bulletins, and through the use of VTEC, CAFÉ would then generate an output message customized for NWR internally, using VTEC phenomenon/significance codes and VTEC action codes to govern tone alert settings (CAFÉ WBC4CRS formatter).

NWRWAVES begins with the WOU(x) issued by the SPC for all convective watches.  The WOU(x) includes all affected land FIPS codes and marine zones (regardless of state and CWA), VTEC, with the VTEC phenomenon and significance codes, the VTEC action code (NEW, CON, CAN, etc.), and an event tracking number.  The WOU(x) product makes a perfect vehicle from which to prepare all convective watch bulletins.  NWRWAVES will build a watch message from the decoded elements of the WOU (FIPS/marine zone codes, VTEC) through internal code and phrasing.  No part of the actual WOU(x) bulletin is included in the outbound CRS Weather Message. WOU update and cancellation products are ignored.

NWRWAVES will then use any *followup* WCNxxx messages to track the status of a convective watch.  NWRWAVES will internally create a message/call-to-action for all affected areas, with CRS Weather Message attributes (SVA, TOA) based on the hazard.  No part of the actual WCN bulletin is included in the outbound CRS Weather Message.

Alert tones will be sent/not-sent based on the VTEC action code customized by each office under Tab 2 above.  By default settings (per directive 10-1710), the only VTEC action codes that would trigger a new tone alerted SV.A/TO.A product from a WCN would be the codes "EXA" and "EXB", which add new counties to a watch through the WCN.

**NOTE:**  you will need text database triggers for all WOU statements (WOU0 through WOU9), your local office WCN, and any other surrounding office's WCN's that apply to areas covered by your transmitters.  Text database triggers are covered in Section 4.

## SPECIAL NOTES ON NON-WEATHER EMERGENCY MESSAGES (NWEM)

NWRWAVES is fully compatible with the new HazCollect system slated for operational status in 2006.  All the NWEM CRS Weather Messages are included in the default product configuration, with EAS PILS (issuance header and followup header) that are consistent with 10-1710.

**NOTE:** NWRWAVES fully replaces the CAFÉ NWEM formatter.  However, sites that are involved in the HazCollect OT&E in the fall of 2005 should use the CAFÉ NWEM formatter during the OT&E, to ensure consistent results.  They can then switch products over to NWRWAVES after the testing period has ended.

An enhanced capability of NWRWAVES is that a site can change the EAS PILS (issuance header and followup header) if state or local broadcaster policy is to not use the new EAS PILS. For example, the Missouri Broadcasters Association has asked the NWS to use the EAS PIL "**CEM**" for all these new hazards until further notice, as many member stations have not upgraded their EAS equipment. All these NWEM hazards can be set to convert their AWIPS product identifier to a "**CEM**" CRS Weather Message.

Once all products have been configured for your site as needed, you are ready to move on to the Summary Message Configuration tab.

## Tab 3 – Summary Message Configuration

After you have set properties for all your products, the next step is to configure summary message settings. The summary message can be a powerful addition to your CRS product suite. Generating a summary of active hazards was a function of the WWA NWR formatters.

The basic function of the NWRWAVES summary message function is as follows: sites can configure their product configuration settings to select which (if any) product types are tracked by NWRWAVES for summarization purposes. Once a local threshold is exceeded, NWRWAVES will generate a message summarizing any applicable hazards. The summary message can be used within a regular Broadcast Suite to bring a periodic short summary of these hazards, or the summary message can itself be used to trigger a higher suite on your CRS, thus shortening a lengthy broadcast if many hazards are in effect.

In the NWRWAVES Setup GUI, click on the third tab, which is labeled **Summary Message Configuration**.



**Figure 5 – Summary Message Configuration Tab**

Under the "Summary Message Properties", you can select the following options:

1) Summary Message PIL: your AWIPS legacy state node will make up the first three letters of the summary PIL, and the last three letters (labeled 'NWX' on the GUI) will be the unique three-letter mnemonic that you gave each of your transmitters. You can select the middle three letters of the

summary message. For example, for transmitter MCI for the Kansas City office (state node is STL), the summary message type (from the GUI above) would be 'STLSUMMCI'.

2) # of Bulletins to Trigger Summary: this is the minimum number of active hazards (with the summary message option set to "YES" in the product configuration) that are required before NWRWAVES begins to generate a summary message.

3) Include intro (yes/no): if "Yes" is selected, NWRWAVES will include the text, "The following watches (warnings) (and advisories) is/are in effect" as an intro phrase for its summary of active hazards.

4) Include Preamble (yes/no): the same as the Product Configuration setting, if this is set to "Yes", then NWRWAVES will include the preamble in its intro phrase for the summary message.

5) Include Issue Time? (yes/no): the same as the Product Configuration setting, if this is set to "Yes", then NWRWAVES will include the time the summary message was prepared in its intro phrase for the summary message.

6) Transmission: you can set whether the summary message is sent directly to CRS for airplay, or whether it gets placed in the 'Pending' side of the NWRWAVES Browser. The default setting is set to 'Pending'.

The right hand side of the GUI contains settings that effect the main part of the summary message wording.

7) County (FIPS) Codes: if this radio button is selected, NWRWAVES will include the words 'county', 'parish', 'counties', 'parishes', or 'independent city(ies)' after its summary phrase "for the following". Proper wording will be used for whether the FIPS code is for a county, a parish, or an independent city.

8) Zone codes: you can govern (by selecting the appropriate option) whether for UGZ codes NWRWAVES follows its summary phrase "for the following" with the word 'county (parish), counties (parishes)', 'area(s)', 'location(s)', or simply nothing at all.

9) Marine zones codes: functions like #8 but for marine zones. Options are to follow the phrase "for the following" with nothing, 'coastal location(s)', or 'marine location(s)'.

When you are satisfied with the summary settings, click the green "STORE SUMMARY CONFIGURATION SETTINGS" to save them.

**STOP** **You have now configured the first three tabs of the NWRWAVES Setup GUI. If your site is not a coastal site, and you have no marine responsibilities, you have completed the software configuration, and you may exit the NWRWAVES Setup GUI (File pull-down menu, click "Save and Exit"). You may proceed directly to Section 4 – Setting AWIPS Text Database Triggers, to configure AWIPS to send products through NWRWAVES.**

If you do have marine responsibilities or are a coastal office, you must complete Tab 4 – Marine/Tropical Product Configuration before you are done.

## Tab 4 – Marine/Tropical Product Configuration

Most marine products will play through NWRWAVES with little customization needed for the individual products. Extensive work in the word replacement dictionary (Section 6) or VIP will be needed to replace acronyms and abbreviations with full word phrases, to render a quality NWR product.

There are three main sections under the Marine/Tropical Product Configuration Tab (Figure 6), **Hurricane Local Statement, Tropical Storm Product** and **Great Lakes Forecast**.
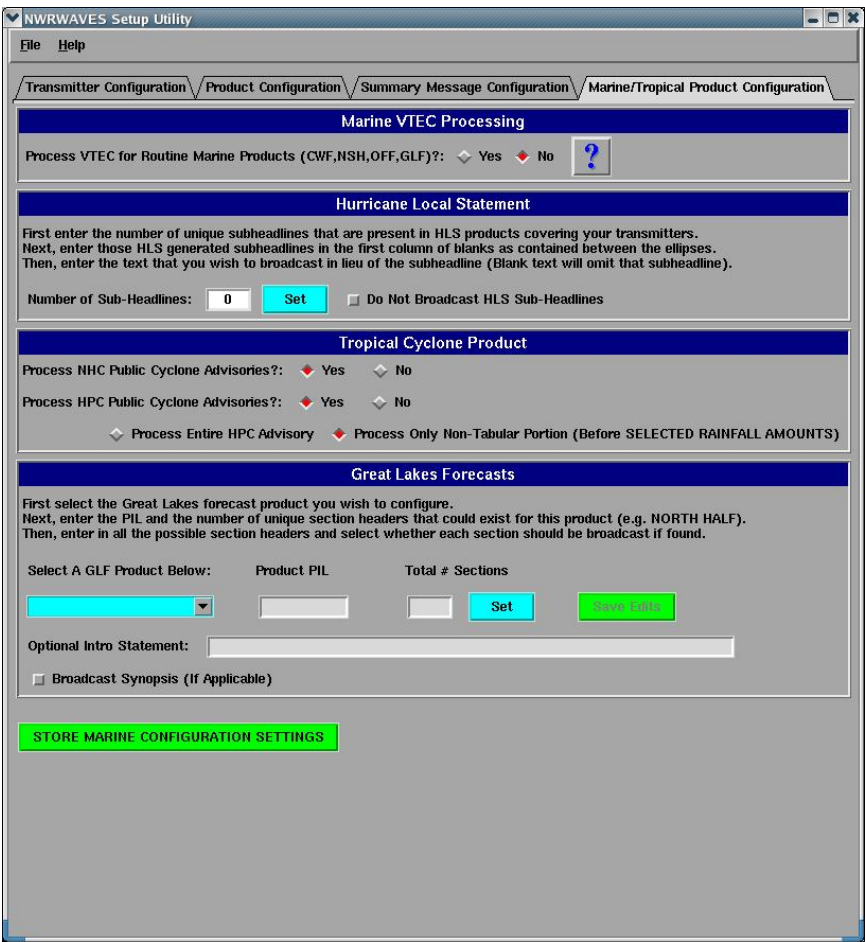


**Figure 6 – Marine/Tropical Product Configuration GUI**

## *Marine VTEC Processing*

Next to the label "Process VTEC for Routine Marine Products (CWF, NSH, OFF, GLF)?" is a 'yes/no' option. Check 'yes' to enable VTEC usage in your marine products. Check 'no', and NWRWAVES will process all marine products but ignore any VTEC lines. **NOTE**: see pages 11 and 12 of NWRWAVES documentation for details on whether you choose to use or not use VTEC with your marine product suite.

## *Hurricane Local Statement*

The Hurricane Local Statement (HLS) Section is used to configure how the HLS is formatted for airplay. NWRWAVES can be configured to replace the section headlines form the HLS with more radio friendly text. An example of this can be seen in figure 6. You can also omit a section headline individually by leaving the **REPLACED CRS PHRASE** section blank.

To configure this section:

1) If you do not want any of the sub-headlines broadcast from your office's (or an adjacent office's) HLS, simply check the box next to the label "Do Not Broadcast HLS Sub-headlines".

2) If you do wish to broadcast these sub-headlines, left-click in the box labeled, "Number of sub-headlines", enter the number of sub-headlines your office (or an adjacent office) uses as their standard HLS format, and then left-click the blue 'Set' button. Sub-headlines are those phrases within the HLS that look like this: "…WATCHES/WARNINGS…"

3) A number of boxes will appear in the HLS section, which will match the number you just entered.

4) For each sub-headline, enter its original text from the HLS product, and then list its CRS replacement phrase to the right of the original phrase. For example, you might want to replace the phrase "…WATCHES/WARNINGS" with "watches and warnings in effect" to enhance airplay.

*Tropical Cyclone Product (TCP)*

There are two options you can configure in this section that affect processing of the TCP product from TPC and HPC.

5) Process NHC Public Cyclone Advisories? (yes/no): if this is set to 'No', then NWRWAVES will **not** process the TCPAT(x) bulletins issued by the Tropical Prediction Center, even if you have the text database trigger set to send the TCPAT(x) bulletin to NWRWAVES.

6) Process HPC Public Cyclone Advisories? (yes/no): this flag tells the software whether to ignore or process the TCPAT(x) issued by the HPC once a tropical system has made landfall. If the answer is set to "Yes", you also have additional flags to either read the entire advisory as written, or to filter out any tabular data (such as inland rainfall totals) that HPC may include in the product.

### SPECIAL NOTES ON TROPICAL CYCLONE PRODUCT PREPARATION

NWRWAVES functions much differently than CAFÉ with respect to its tropical cyclone message generation. CAFÉ would process the TPC TCPAT(x) bulletins, and through the use of phrase searches and key wording, CAFÉ would then generate an output message customized by a latitude/longitude box, and where the storm was with respect to this box. If it met certain phrase and location criteria, the inbound CRS Weather Message would be assigned the proper EAS code (TRA, TRW, HUA, HUW) for alert on NWR.

NWRWAVES treats the TCP just like the HLS, as a regular product that contains information on the storm. The product suite needed to process hurricane watch/warning and tropical storm watch/warning bulletins is the new TCVAT(x) suite issued by the TPC, for every tropical system that warrants a watch or warning along the coast.

The TCVAT(x) product is a new product issued by the TPC. It includes all affected land FIPS codes and marine zones, VTEC, with the VTEC phenomenon and significance codes, the VTEC action code (NEW, CON, CAN, etc.), and an event tracking number. The TCVAT(x) product makes a perfect vehicle from which to prepare all hurricane watch/warning and tropical storm watch/warning information bulletins.

NWRWAVES will use the TCVAT(x) message to track the status of a watch or warning product. Similar to the approach used to monitor the WOU and WCN product suite for convective watches, NWRWAVES will create a message internally for all affected areas, with CRS Weather Message attributes (TRW, TRA, HUW, HUA) based on the hazard. Alert tones will be sent/not-sent based on the VTEC action code customized by each office under

Section 3 – Tab 2 above.  This will prove to be a more reliable, dependable means of tracking tropical system watches and warnings than phrase parsing from the TCP.

An example product suite on CRS for tropical systems, would lead off with the appropriate watch/warning bulletin (TRA/TRW, HUA/HUW) as formatted within NWRWAVES, that tells what is in effect, for what areas and for which tropical system name.  This would be followed-up by either the local office (or surrounding office) HLS which contains the details on the storm, where it's headed and what impacts/actions are needed.  Offices could also include the TCP if desired, especially if they are inland offices that just wish to provide information on tropical systems.  Coastal offices will find much of its information would be redundant to the first two messages.

**NOTE:**  you will need text database triggers for all TCVAT(x) statements (TCVAT1 through TCVAT5) to properly prepare and disseminate tropical watches and warnings.  Text database triggers are covered in Section 4.

*Great Lakes Forecasts*

The Great Lakes Forecast (GLF) section is used to configure how the GLF is formatted for airplay.   These capabilities replace the customized settings found in the CAFÉ GLF formatter.

To configure (if needed) the Great Lakes Forecast options, complete these steps:

2) Choose a Great Lake from the **Select a GLF Product Below** dropdown list.
3) Enter the AWIPS product identifier for the GLF (example CHIGLFLM).
4) Enter total number of sections in the GLF (usually, this is denoted within the text of the product such as "NORTH HALF", "SOUTH HALF", etc.
5) Click the **Set** button
6) Edit the **Optional Intro Statement** if desired.  Any text entered will be used as an intro phrase for the GLF output.
7) Click the **Broadcast Synopsis (If Applicable)** button if desired. If this is checked, the ".SYNPOSIS" section of the GLF will be included in the CRS output, otherwise it will be omitted.
8) Fill in the **SECTION HEADERS** entry boxes to reflect the break points used in the GLF.  Again, an example would be phrases such as "NORTH HALF" and "SOUTH HALF".
9) Click on the **Broadcast This Section** button for each SECTION HEADER you wish to have formatted for airplay.

In Figure 6, the configuration settings for the GLF are as follows:
- Process the AWIPS product (if triggered) CHIGLFLM for Lake Michigan
- Do not include any intro statement
- Broadcast the ".SYNOPSIS" section within the output of the CRS GLF forecast
- Only broadcast the NORTH HALF portion of the forecast

When you have completed all applicable sections of this tab, click the green STORE MARINE CONFIGURATION SETTINGS button to save your settings.

You have now completed customization of NWRWAVES for your office.  Proceed to **Section 4 – Setting AWIPS Text Database Triggers**, to configure AWIPS to send products through NWRWAVES.

# 4. SETTING AWIPS TEXT DATABASE TRIGGERS

NWRWAVES software is executed as an automated response to an AWIPS text database trigger (Informix OB5 and earlier, Postgres after OB6). Offices that have used CAFÉ will notice some degree of familiarity in the establishment of database triggers.

You can, and should, run triggers for both your CAFÉ and NWRWAVES formatters during the transition period between CAFÉ and NWRWAVES.  You can run NWRWAVES in a test mode, which is what you will need to do in this transition period to ensure a smooth switch between the two formatters.  Once you decide to switch a product/products over to NWRWAVES in an operational mode, you would need to remove the legacy CAFÉ triggers.  To establish a suite of triggers needed for NWRWAVES operation, perform the following steps:

1) Log into an AWIPS workstation with a user account that has fxalpha group privileges and open up a terminal window.

2) Change directories to the trigger directory.

    **cd /data/fxa/siteConfig/textApps**

3) Make a backup copy of your site trigger information, in case you need to revert back to it.

    **cp siteTrigger.template siteTrigger.template.mmddyyyy**

    where '**mmddyyyy**' is the numeric current date

4) Edit your site trigger configuration.

    **gedit siteTrigger.template &**

When you view this file, you will see a listing of AWIPS product identifiers, along with an action that is to be completed upon receipt of that product identifier into the text database.  If you are a CAFÉ site, there will be several entries that call CAFÉ scripts to format data.  An example of a CAFÉ entry in your site trigger configuration will look something like the following:

**STLSVREAX                    /home/CRS/SVR/nwrsvr.csh STLSVREAX**

**Do not change or remove these CAFÉ text database triggers!**  Your initial configuration will be to set NWRWAVES into test mode, so you can monitor its performance and ensure that it will work successfully with your CRS database prior to making the switch over to operational mode.  The WWA NWR formatters do not use text database triggers.

5) For each text product that you wish to be formatted by NWRWAVES, you will need to add a line to the siteTrigger.template file using the following syntax (CCCNNNXXX is the 8/9 letter product PIL):

    **CCCNNNXXX                    /awips/adapt/NWRWAVES/nwrwavestest.csh**

The script '*nwrwavestest.csh*' is used by NWRWAVES to execute the formatter in TEST mode.

You will need an entry for each product that you wish to send through NWRWAVES.  This entry (the CCCNNNXX field) is the exact AWIPS product identifier for each product you wish to process!  **An example of text database triggers set at WFO Pleasant Hill for NWRWAVES execution can be found in Appendix B**.

**SPECIAL NOTES REGARDING TEXT DATBASE TRIGGERS:**

For convective watches, you will need to include all ten WOU(x) products issued by the Storm Prediction Center, along with all WCN products that apply to your CRS broadcast service areas.  This will likely include your WCN, and possibly WCN's issued by surrounding offices.  For the WOU(x) products, a section of your siteTrigger.template will need to include these entries:

| | |
|---|---|
| **CCCWOU0** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU1** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU2** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU3** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU4** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU5** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU6** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU7** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU8** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWOU9** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **CCCWCNXXX** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |

**CCC** should be set to your legacy state node for all WOU products and for your **WCNXXX** product.  **CCC** should be set to the legacy state node for all other office **WCNXXX** products that you need to cover your broadcast service areas.

For tropical cyclone products needed to generate Tropical Storm Watches/Warnings, and Hurricane Watches/Warnings, you will need to include all five TCVAT(x) products issued by the Tropical Prediction Center.  If your site is a coastal office, for the TCVAT(x) products, a section of your siteTrigger.template file will need to include these entries:

| | |
|---|---|
| **MIATCVAT1** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **MIATCVAT2** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **MIATCVAT3** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **MIATCVAT4** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |
| **MIATCVAT5** | **/awips/adapt/NWRWAVES/nwrwavestest.csh** |

**NOTE**: if your site has added the TCV product suite to the local CCC lookup in AWIPS, you can replace MIA with CCC as appropriate.  Since the TCV is a new product for 2005, many AWIPS sites may not have accomplished this configuration.  Also, if your site still wishes to process the TCP for informational purposes, you would need to add all five TCP products into your trigger suite.

6) After you have finished adding in the suite of triggers, we will need to save the file and re-localize for these new text database triggers.

**Save and exit out of the text editor**

7) If your site is on OB5 or earlier versions of software, log onto DS1. If you are an OB6 – Phase 3 site or later (using Postgres), log onto the DX1.

**ssh ds1** (**ssh dx1** if you are on Postgres)

8) Change user to fxa and type the following commands:

**su – fxa**

**cd /awips/fxa/data/localization/scripts**

**./mainScript.csh –trigger XXX**

The end result of completing steps (1) through (8) is that NWRWAVES will begin to process products in TEST mode for your site. In TEST mode, generated CRS output will be placed in the /awips/adapt/NWRWAVES/TEST directory instead of being sent to CRS or the 'Pending' side of the NWRWAVES Browser. You can use your favorite editor, viewer or browser to review the output over time, to ensure that NWRWAVES is processing inbound data and producing correctly formatted outbound CRS products.

The end result of completing steps (1) through (8) is that NWRWAVES will begin to process products in TEST mode for your site. In TEST mode, generated CRS output will be placed in the **/awips/adapt/NWRWAVES/TEST** directory instead of being sent to CRS or the 'Pending' side of the NWRWAVES Browser. You can use your favorite editor, viewer or browser to review the output over time, to ensure that NWRWAVES is processing inbound data and producing correctly formatted outbound CRS products.

**Having completed Sections 1 through 4 through this point, you have successfully configured NWRWAVES for your local site. You have established transmitters (broadcast programs) with the appropriate listing of county (parish), independent cities and zone codes. You have customized your product list for processing, and you have established the AWIPS products from your text database that are to be processed through NWRWAVES.**

**NWRWAVES is now running on your AWIPS in TEST mode.**

The end result of your work to date will be visible in the **/awips/adapt/NWRWAVES/TEST** directory, where NWRWAVES will place its output for your review. You will need to run in TEST mode until you have the opportunity to properly configure your CRS database in Section 5, and you also have the chance to review NWRWAVES output and validate that it is working properly. Do not plan to transition to an operational mode until both of these have been accomplished and the results are acceptable to you.

**Perform steps 9 through 15 below only when you are ready to begin operational use of NWRWAVES.**

**TRANSITIONING PRODUCTS TO OPERATIONAL MODE**
When you are ready to begin transitioning NWRWAVES to operational status, you can do this on a product-by-product basis. **Do not plan to move from TEST to OPERATIONAL mode in NWRWAVES** until you ensure your CRS is correctly configured to accept the format of Weather Messages from NWRWAVES. **Section (5) – NWRWAVES AND YOUR CRS DATABASE** gives you the information you need to ensure your CRS is ready to accept NWRWAVES output.

The steps necessary to transition a product or products to operational mode are as follows:

9)      Repeat step (1) through step (7) above in Section 4.  For all instances of a product in step (5) that you wish to transition to operational status, replace the call:

   **/awips/adapt/NWRWAVES/nwrwavestest.csh**
   **with**
   **/awips/adapt/NWRWAVES/nwrwaves.csh**

10)     Remove the associated CAFÉ trigger for this product.
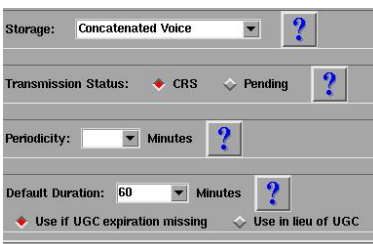        **NOTE**: There may be multiple AWIPS product identifiers for this product if you format other WFO AWIPS products for this CRS product type.  Be sure to remove all applicable CAFÉ product triggers for this product or you will see duplicate CRS Weather Messages!

        **NOTE:** If you are a site that uses the WWA NWR formatters, you will need to go into the WWA Admin GUI and disable NWR formatting for this product type.  Alternatively, you can use GHG in lieu of WWA, as the WWA NWR formatter only works for products actually prepared through WWA.
11)     Repeat steps (7) and (8) to re-localize your new triggers to establish this set of new products to operational mode.

Once you have set the products to process operationally, the resultant CRS output will (by default) be placed in the 'Pending' side of the NWRWAVES Browser.  This is because your Product Configuration was set to place the output there in your original configuration.  To facilitate automated transmission to CRS:

12)     Go back to Section 3 – Tab 2.
13)     Repeat steps (1), (2) and (3r) under the 'Product Configuration' tab.  You will be switching the "Transmission Status" section from 'Pending' to 'CRS' (Figure 7).
14)     Click the green "**SAVE EDITS**" button to save the product configuration
15)     Repeat steps (13) and (14) above for all products you are transitioning to operational mode and automated CRS broadcast.



**Figure 7 – example of Transmission Status set to automated relay to CRS**

# 5. NWRWAVES AND YOUR CRS DATABASE

NWRWAVES was designed to produce transmitter (broadcast program) specific output, to best focus the content of Weather Messages on the listening area of that transmitter. Unique CRS Weather Messages will be produced for each product, or each segment within a segmented product, using a standardized naming scheme.

The standard nomenclature for a CRS Message Type is **CCCNNNXXX**. This format is very similar to AWIPS product identifiers. NWRWAVES prepares its Weather Messages for the three components (CCC, NNN, XXX) using the following logic:

CCC – derived from your AWIPS legacy state node environmental variable. This is sourced from the file /awips/fxa/data/localizationDataSets/XXX/AFOS_CCC_Name.txt. 'XXX' is your AWIPS site identifier.

NNN – the middle three letters will come from your settings for each product in the Product Configuration settings. Remember, the term 'product' is not just inclusive as a one-to-one relationship to an AWIPS product identifier. 'Product' refers to the combination of VTEC phenomenon and significance code when appropriate (several AWIPS product identifiers can have multiple VTEC phenomenon/significance code combinations such as the AWIPS WSW product). The middle three letters are either the "Initial Header" or "Followup Header" entries (based upon VTEC and follow-up statements) as you assigned in Section 3 – Tab 2 above (Figure 8).



**Figure 8 – an example of NWRWAVES product SV.W and it's unique NNN codes assigned by this product type**

XXX – the last three letters used in Weather Message assembly is the three-character mnemonic you assigned unique to each transmitter in Section 3 – Tab 2 above.

In the case of the Kansas City/Pleasant Hill office, our AFOS state node identifier is STL. We have eight transmitters (MCI, STJ, IRK, MIA, CRL, CLN, MYV, TTN). Therefore, for the NWRWAVES product SV.W (Severe Thunderstorm Warning) as shown above in Figure 8, an inbound AWIPS product of STLSVREAX for all of our CWA would yield the following Weather Messages (depending on the VTEC action code):

| Initial Issuance (/O.NEW.KEAX.SV.W) | Follow-up Issuance (/O.CON.KEAX.SV.W) |
| --- | --- |
| STLSVRMCI | STLSVSMCI |
| STLSVRSTJ | STLSVSSTJ |
| STLSVRIRK | STLSVSIRK |
| STLSVRMIA | STLSVSMIA |
| STLSVRCRL | STLSVSCRL |
| STLSVRCLN | STLSVSCLN |
| STLSVRMYV | STLSVSMYV |
| STLSVRTTN | STLSVSTTN |

For non-VTEC coded products, the only header that will be used by NWRWAVES will be the "Issuance Header" entry, as there is no way to accurately determine if the product is an initial issuance or a follow-up. Thus, you will only need to ensure the presence of the list under the "Issuance Header" in your CRS database.

Therefore, in your CRS database, you will need to ensure that for every product you produce through NWRWAVES, you have a unique Message Type defined that matches this naming scheme, for both VTEC and non-VTEC products. In the case of the Pleasant Hill office where we have eight (8) transmitters, every VTEC encoded product will yield a maximum of **16 unique Message Types**, and a **maximum of eight unique Message** Types for every non-VTEC product (or VTEC product where the two headers are the same).

## SETTING UP THE UNIQUE MESSAGE TYPES IN YOUR CRS DATABASE

The preferred method to adjust and configure your CRS database is through the GUI system on your CRS MP workstation. Sites are discouraged from hand-editing a copy of their ASCII database, unless the site focal point has a thorough knowledge of its structure.

Sites that have run the WWA NWR formatters in the past will already have many of these unique Message Types defined in their database, as WWA produced transmitter-specific output. CAFÉ users will likely find a mix of unique and global Message Types depending on the AWIPS product identifier type.

The following is a recommended methodology to use in ensuring your CRS database is ready to accept output from NWRWAVES. It will work well in preparing CRS for NWRWAVES on a product-by-product basis.
**NOTE: Before you begin making any changes to your CRS database, use the 0MP Database backup utility to make a good backup copy of your existing database before you begin! This way, if you need to revert back to the original database, you can do so.**

1) Choose a unique product that you wish to prepare and/or ensure your CRS database to accept.
2) Make note of the "Issuance Header" and "Followup Header" of that product in the NWRWAVES Product Configuration GUI (Section 3 – Tab 2). **NOTE**: if this is a non-VTEC product such as the HWO, NOW, etc., you only need to note the "Issuance Header".
3) In the CRS Message Type GUI (on your MP), you can find the "Message Types" GUI under the 'Messages' pull-down menu. You have three options on how to proceed, depending on how your CRS database is already structured.

> **IMPORTANT NOTE: for any of these three options, you will want to ensure the following…**
> With any Message Type that will involve tone alerts (WRSAME, or WRSAME and 1050Hz), you want to be sure that the **only transmitter** that has a red 'check mark' next to its label in the "SAME Transmitters" column is **the one that matches the last three letters of the Message Type**. If all the boxes are checked, then the inbound NWRWAVES product will tone alert multiple times, on multiple transmitters, in instances where an LAC overlaps multiple transmitters. Ensure that only one "SAME Transmitters" option is selected for each Message Type to prevent this from occurring.
>
> Also, you will likely also want to ***not*** include these unique Message Types (if they are applicable watch/warning/advisory type products) in your Emergency Override product list. The list in Emergency Override can get quite lengthy, and the process of initiating multiple EO sessions can lead to too much work and a delay in getting a broadcast completed for multiple transmitters.

a) If you already have unique CRS Message Types defined per transmitter, and these Message Types begin with your state node CCC and end in the three-character combinations you have set in your NWRWAVES transmitter configuration, you have the correct naming scheme for this product, and you can complete this step (3a). Otherwise, proceed to step (3b) below.

Ensure that **<u>only one</u>** 'SAME Transmitters' transmitter is checked as described above, if this Message Type is one that involved alert tones of any type. Make sure the 'Emergency Override' checkbox is not selected for this unique Message Type. Your Message Groups, Broadcast Suites (and triggers) will already contain these Message Types, and no additional work will be needed to facilitate NWRWAVES output from being scheduled on your CRS. Save the Message Type and proceed to step (4).

b) If you already have unique CRS Message Types defined per transmitter, and these Message Types begin with your state node CCC but **\*do not\*** end in the three-character combinations you have set in your NWRWAVES transmitter configuration (say you have a scheme such as "NW1, NW2", etc., and you wish to change these last three letters), complete this step (3b). Otherwise, proceed to step (3c) below.

Perform the following steps:

1. Call each Message Type up through the GUI.
2. Edit the Message Type XXX for each individual product (in the CCCNNNXXX format), and change the last three characters to match that of your transmitter.
3. Ensure that only one 'SAME Transmitters' transmitter is checked as described above, if this Message Type is one that involved alert tones of any type.
4. Make sure the 'Emergency Override' checkbox is not selected for this unique Message Type.
5. Save the Message Type.
6. Repeat (1.), (2.), and (3.) for all other existing Message Types of this particular product category.

The CRS software will take your changes to these existing Message Types and will propagate the adjusted Message Type identifiers through all existing Message Groups and Broadcast Suites (including triggers). Proceed to step (4).

c) If you do not have unique CRS Message Types defined for each transmitter (say you have a global Message Type such as CCCSVRXXX such as in CAFÉ), you will need to add them to your CRS database. To do this:

1. Through the CRS Message Type GUI, create a new Message Type for a transmitter.
2. Establish its baseline attributes.

3. Ensure that only one 'SAME Transmitters' transmitter is checked as described above, if this Message Type is one that involved alert tones of any type.
4. Save the Message Type.
5. Repeat (1.), (2.), (3.) and (4.) to create Message Types of this particular product category for all transmitters.
6. You will then need to add these Message Types to any applicable Message Groups and/or Broadcast Suites for each transmitter.
7. Once the new Message Types have been assigned to a Broadcast Suite in some fashion, be sure to re-download the applicable Broadcast Programs to each transmitter. Proceed to step (4) below.

4) Once you have established unique Message Types for this particular hazard, it is recommended that you also create (if you don't have one already) a generic Message Type for this NWRWAVES product. The generic Message Type would have the format CCCNNNXXX, where the 'XXX' in this case would be your office AWIPS identifier. At Pleasant Hill, we used the format **STLNNNEAX** for all our generic Message Types.

Assign this generic Message Type to all transmitters (include it with its specific counterpart in all Broadcast Suites or Message Groups). Ensure that **all** 'SAME Transmitters' transmitters are checked as described above, if this Message Type is one that involved alert tones of any type. Also, **use this one (if needed) as the ONLY one set to appear in your Emergency Override GUI (this is a check box on the Message Type GUI).**

The generic Message Type is quite useful for manual recordings, should NWRWAVES fail for any reason. Since the Message Type is assigned to all transmitters and can be scheduled for any transmitters, if an office has to send a warning via EO, the operator only has to make the one 'live' broadcast and then have the message go into all applicable transmitter programs. If a site uses the specific Message Types for their EO entries, the NWR Operator will have to send the 'live' warning multiple times, once for each specific Message Type.

5) Repeat steps (1) through (4) for the "Followup Header" settings if the AWIPS product for this hazard is a VTEC product, and this entry is different from the "Issuance Header". If both are the same, you can skip step (5).

6) Repeat steps (1) through (5) for NWRWAVES products as you are ready, to ensure they are ready for transition into an operational NWRWAVES environment.

**IMPORTANT NOTES ABOUT CRS MESSAGE TYPES AND YOUR CRS DATABASE**

Some helpful hints as you transition from existing NWR formatters (WWA NWR, CAFÉ) to NWRWAVES:

a) Use the approach of having unique Message Types in your database for NWRWAVES, and a generic Message Type for that same NWRWAVES product to create an optimal CRS operating environment.

For the NWRWAVES product TO.W (Tornado Warning) in the Pleasant Hill CRS database (we have eight transmitters), we have nine different Tornado Warning Message Types and nine unique SVS Message Types (SVS is the 'Followup Header' used in the NWRWAVES Product Configuration for follow-up statements). There are eight unique Message Types each for TOR and SVS, and one for each that is generic. We include the generic STLTOREAX and STLSVSEAX Message Types in our Emergency Override GUI. Any warning or update for any transmitter can be broadcast through EO, then it can be scheduled on any applicable transmitter with nominal work.

b) **Do not delete, change or remove any existing Message Types that are used by your operational NWR formatter until you have fully switched that product to operational status in NWRWAVES!** Once you make the full transition to NWRWAVES for this particular product, you can safely remove any legacy Message Types through the CRS GUI interface.

c) Make sure that for any unique Message Type that is used for tone-alert products, that the only 'SAME Transmitter' checked in the list is the one whose three-character mnemonic matches that of the last three letters of the Message Type. This will prevent multiple alerts being sent for products that involved LAC(s) shared amongst more than one transmitter. Make sure any generic Message Type used for alert purposes has all 'SAME Transmitters' checked on the Message Type GUI.

d) A suggested transition is to make the switch on a product-by-product basis. This will avoid wholesale changes to your CRS database at one time. Also, after each NWRWAVES product is configured with the Message Types needed in your CRS database (or a small subset of products), make a backup copy of that CRS database (through the 0MP database backup utility) in case you need to revert back to a previous version.

e) Remember, if you add new Message Types to your CRS database, you also need to add them to any applicable Broadcast Suites, and adjust any triggers as necessary to ensure proper broadcast of information.

# 6. NWRWAVES OPERATIONS

This section of documentation will describe the NWRWAVES Browser, NWRWAVES program execution, and detail the logging performed by NWRWAVES to assist in troubleshooting procedures.

**NWRWAVES BROWSER**

The main interface that users will notice as they use NWRWAVES is the NWRWAVES Browser. This new browser will be linked during the install such that it can be launched using the standard **"NWRBrowser"** entry in the AWIPS workstation applications menu. The overall look and feel of the NWRWAVES Browser is similar to the original NWRBrowser, however there are a number of new features and enhancements that are noted below.
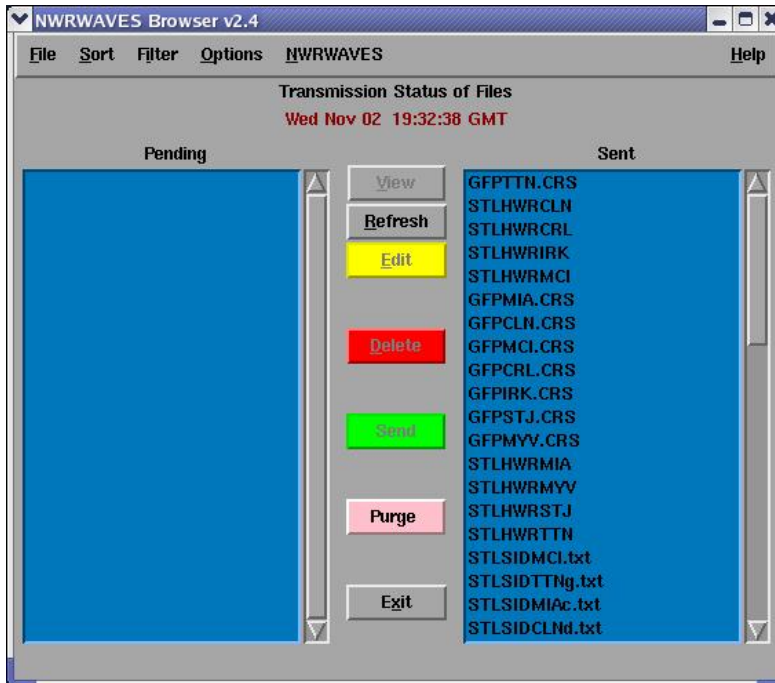
**Figure 9 – NWRWAVES Browser (front-end application to NWRWAVES)**

There are a series of pull-down menus across the top of the NWRWAVES interface:

1) **File** Menu (Keyboard Shortcut Alt-F)
   a. Exit – Used to close the browser

2) **Sort** Menu (Keyboard Shortcut Alt-S) – Because the number of items in the browser list boxes can become quite lengthy, a number of sorting capabilities were added to allow users to quickly locate outbound or transmitted CRS messages.
   a. None – No sorting is done and the browser will function similar to the old NWR Browser.
   b. Alphabetical (Default) – Files in the Pending and Sent list boxes will be sorted in alphabetical order.
   c. Expiration Time – Files in the Pending and Sent list boxes will be sorted in the order in which CRS messages are scheduled to expire.
   d. Applying the **"Decreasing Sort"** checkbox will sort the list boxes in either reverse alphabetical order (alphabetical sort applied) or in the reserve order in which CRS messages are scheduled to expire (Expiration Time sort).

3) **Filter** Menu (Keyboard Shortcut Alt-i) – The ability to filter items in the NWR Browser was added as another means to quickly located products in the Pending and Sent list boxes
   a. Filter by Transmitter – If you have configured your transmitters as in Section 1, you should see your list of transmitters present. Clicking any of the transmitter mnemonic radio buttons will cause the NWRWAVES browser to display only those outbound/transmitted products which are applicable to the selected transmitter.
   b. Filter by Product Type – The NWRWAVES Browser filter function for products contains a vast list of the most widely used products. Clicking on any product type radio button will filter the display to only show those product types.

4) **Options** Menu (Keyboard Shortcut Alt-O)
   a. **Clear Old Products** (and its equivalent <mark style="background-color:magenta">Purge</mark> button on the main browser display) will allow a user to delete files whose CRS message expiration time has expired. The user will be prompted to remove products from both the Pending and Sent directories. This feature can be quite helpful in eliminating dead products from an extensive file listing, but be wary that there may be instances when a user may want to maintain an expired product for later retransmission.
   b. **Update Expiration Time –** This option will become selectable once a user highlights a product in the Sent list box with the left mouse button. This feature allows a user to modify the expiration time of a product and retransmit it to CRS. This method is a great way to allow a forecaster/HMT to remove a product from the CRS broadcast cycle without having to physically remove it at the CRS console.
   c. **Auto Refresh (Default On) –** This selection tells the NWRWAVES browser to auto update the Pending and Sent list boxes.
   d. **Set Refresh Interval… -** the refresh interval can be changed from the default of 30 seconds by clicking on this menu item and entering a new number (in seconds) into the box.
   e. **Highlight Warnings (Default On) –** This selection will cause the NWRWAVES browser list boxes to briefly change from a blue to a purple/pink background color when a short-fuse warning has been issued.
   f. **Editor –** The editor selection allows a user to select which editor is loaded when a user clicks the <mark style="background-color:yellow">Edit</mark> button on the main browser interface. The Default Editor will launch the old NWR Browser editor which allows a user to edit a transmitted product and modify the CRS message header properties.

<span style="color:red">**NOTE:** although there are three other LINUX editors available for use, sites are encouraged to use the baseline NWR Browser editor to ensure that they do not inadvertently corrupt the CRS Weather Message Header.</span>

5) **NWRWAVES** Menu (Keyboard Shortcut Alt-N)
   a. **NWRWAVES Setup –** Refer to Section 3 for launching the NWRWAVES Setup Utility. <span style="color:blue">This option is administratively restricted by AWIPS user accounts.</span> Most NWRWAVES users will not have access to the Setup Utility.

<span style="color:red">**NOTE**: you will only be allowed to open one version of the Setup GUI on your AWIPS at one time. This is controlled by a lock file which is created when the Setup GUI is launched, and is removed when you exit the Setup GUI.</span>

- Open a shell on any AWIPS workstation as a user with 'fxalpha' group privliges.
- Type **cd /awips/adapt/NWRWAVES**
- Type **rm –f setup.lock**
- Exit from the shell

b. **View/Edit VTEC_Summary File –** For offices using the summary message capabilities described in Section 3 – Tab 3 (page 17), users can manually edit/delete specific product summary messages should the automated VTEC replacement method fail.  The pop-up GUI which appears when there are active hazards being track for summarization (Figure 10) is a simple interface.  You select the hazard you which to modify from a list of buttons, and then you can either clear all LAC(s) at once or selected LAC(s) through their individual radio buttons.  Sites will rarely (if ever) need to use this interface, since active hazards are tracked through VTEC action codes in follow-up statements. This will be a useful interface though, if you track a non-VTEC hazard such as an FFW in the interim period before full VTEC implementation.
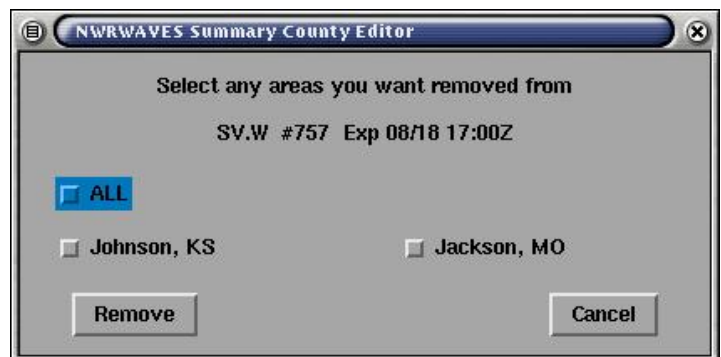


**Figure 10 – NWRWAVES summary message editing GUI interfaces**

c. **Regenerate a CRS message –** Allows a user to call an AWIPS PIL from the text database and reprocess the product through the NWRWAVES formatter.  When this option is selected, the user is prompted to enter an AWIPS product identifier then click 'OK'.  The latest version of the product will appear in the 'Regenerate Product' GUI (Figure 11).  Sites can toggle between database versions of the product type by using the "Previous Version" or "LatestVersion" buttons. Once you have the product you wish to re-transmit in the viewer, click the "Send to NWRWAVES" button to re-process this product.

**NOTE:** if you use the "Include Issue Time" lead-in option for a product, the time that will be used is the time that the AWIPS product is processed by NWRWAVES, and not the time it was issued in its Mass Media header (MND date/time line).  If you re-transmit a product, the time mentioned as the issuance time on the air will be the time you requested its retransmission.
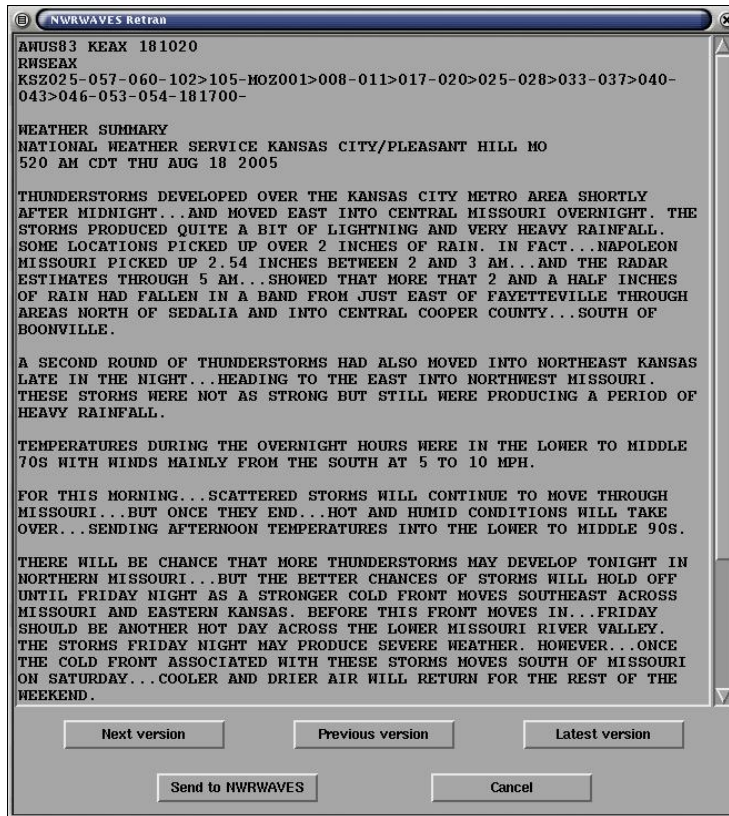
**Figure 11 – NWRWAVES Retransmit product GUI interface**

There are also a series of buttons down the middle of the interface. Some have been mentioned above, and there are a few additional buttons as well:

d. **View button**: if a user left-clicks on a product (in either the 'Pending' or 'Sent' side of the NWRWAVES browser and clicks this button, it will bring up the product in a viewer. This function is identical to the legacy NWRBrowser.

e. **Refresh button**: if clicked, it will force a manual auto-refresh of the NWRWAVES Browser.

f. **Delete button**: if a user left-clicks on a product or products on either side of the browser and then clicks this button, these NWRWAVES products will be deleted from the browser. The user is prompted to confirm the delete (yes/no/yes to all). An improvement over the NWRBrowser is that a user can select multiple products at the same time.

g. **Send button**: if a user left-clicks on a product or products on either side of the browser and clicks the 'Send' button, these product(s) will be sent to CRS. An improvement over the NWRBrowser is that a user can select multiple products at the same time.

h. **Exit button**: this button exits the NWRWAVES Browser.

# 7.  NWRWAVES PROGRAM EXECUTION, LOGGING, TROUBLESHOOTING INFORMATION

NWRWAVES is called through the use of AWIPS text database triggers. You can call for NWRWAVES to run manually two different ways:  you can 'Regenerate a CRS Message' or edit the summary message.  Both of these methods are detailed above.

Here is a breakdown of the execution of NWRWAVES for the receipt of a product:

1) An inbound product is received into the AWIPS database.
2) A text database trigger is executed to initiate NWRWAVES for the inbound AWIPS product. Depending on your settings in your siteTrigger.template file, you will either call the c-shell script that runs NWRWAVES in TEST mode (/awips/adapt/NWRWAVES/nwrwavestest.csh) or the c-shell script that runs NWRWAVES in operational mode (/awips/adapt/NWRWAVES/nwrwaves.csh).
3) These c-shell scripts perform the following functions:
   a) The script takes the inbound product and 'cleans' it up for use.
   b) The inbound product is moved from /data/fxa/trigger to the /awips/adapt/NWRWAVES/QUEUE directory for processing.
   c) A check is performed to ensure that only one version of NWRWAVES is running.  If one is currently active, this iteration will sleep for 30 seconds before checking again.  If the same version is still running after 30 seconds, these scripts will assume a hung process, kill the original one so that this one can begin.  Thorough testing has indicated that a time period much less than 30 seconds is all that NWRWAVES requires for proper execution.
   d) These scripts perform a 'checksum' on the main program (nwrwaves.tcl) and write this checksum to the product's debug file.

   NOTE: The 'checksum' value is a fixed value of the nwrwaves.tcl code as prepared and released into AWIPS baseline software.  If your site has trouble with NWRWAVES, support staff will ask for this value. If it is anything other than the baseline value, it is an indication that someone at your site has made edits to the baseline software. **SITES WILL NOT MAKE ANY LOCAL CHANGES TO THE NWRWAVES SCRIPTS AS DELIVERED!!**  Making local changes to the baseline software may introduce unintended instability to the program, and it will be impossible to troubleshoot your problem if you have made local changes.  Off-site troubleshooting will likely be denied until you restore the baseline version of 'nwrwaves.tcl', and the debug log file reflects the same 'checksum' value as the baseline value.

   NOTE: an extensive debug and operational logging scheme is used in NWRWAVES, to assist in local and off-site troubleshooting. This scheme is detailed in (5) below.

   e) These scripts call the main formatter program 'nwrwaves.tcl'.  The 'test' argument is the only difference between the two c-shell scripts.

4) The main file 'nwrwaves.tcl' is executed next.  All processing related to product preparation, assembling and formatting is performed by this script.  This script does utilize threee additional scripts at different points during message preparation and assembly.  These are located in the /awips/adapt/NWRWAVES/bin directory and are as follows:

a) **UGCDecoder.tcl**:  This module is called by nwrwaves.tcl to decode the UGC and VTEC lines (as appropriate) from an inbound AWIPS product.  If there is no UGC (UGZ) line in the inbound product (such as an RER), then this module will assign the product a 'dummy list' which is one county from each transmitter.  NWRWAVES will use the first county (alphabetically) from each transmitter.  There is no way to control a non-UGC (UGZ) coded product by transmitter.  Every transmitter will receive a copy of the product, with an assigned default expiration time of 360 minutes.

b) **UGCLookup.table**: this is the master baseline lookup table for all counties/parishes/independent cities and zones/fire weather zones/marine zones.  Sites will not modify this file!  If an area is missing, you do have the ability to add it manually through the Transmitter Configuration GUI (Section 3 – Tab 1: Page 7).  Any local LAC's added will be placed in the file localUGCLookup.table in this same /bin directory.  NWRWAVES will source both lookup tables (if applicable) when it searches for UGC/UGZ codes.

**NOTE**: if you do find missing counties/zones that should be in the baseline file, please post them to the NWRWAVES list server (Section 7) to ensure they do get added in a future build release of NWRWAVES.

c) **WordFile.txt**: this file is a legacy from CAFÉ, and you can add words, phrases or wild card entries.  NWRWAVES will make substitutions from the AWIPS product to the outbound CRS products as needed.  The WordFile.txt file is detailed below.

5) Debugging and logging information:  NWRWAVES makes extensive use of logging to assist in troubleshooting.  Unless mentioned specifically, the files below are placed in the directory listed which can be found under the root NWRWAVES directory (/awips/adapt/NWRWAVES).

Here is a breakdown of available resources to you:

a) INPUT directory:  NWRWAVES will archive every AWIPS product that is sent through NWRWAVES.  The product will be named with the 8-9 letter AWIPS Product Identifier, followed by the date/time stamp of the product when it was processed. This date/time stamp will match the stamp assigned to its associated 'debug' and 'output' files, so that you have the input and output that can be easily matched, along with additional debug information.

b) OUTPUT directory: similar to (a) above, but this directory contains all the output (CRS Weather Messages) prepared by NWRWAVES from the files stored in the INPUT directory.

c) LOGS directory: NWRWAVES keeps a daily log of all its activity. These log files are named using this scheme: nwrwaves.mmddyy.log.   These daily logs will track the major processing points of NWRWAVES for every product processed on that day.  The 'checksum' value is also written here.

d) DEBUG directory: NWRWAVES will create a unique 'debug' file for each product processed in this directory.  The debug file naming scheme is: CCCNNNXXX_yymmddhhmmssdebug.txt

where the CCCNNNXXX is the inbound AWIPS product identifier.  You will be able to match this file with its corresponding entries in the INPUT and OUTPUT directories.  The debug file contains a log of the major and minor processing points of NWRWAVES execution for this particular product.

e)  SUMMARY directory: any summary messages generated by NWRWAVES are kept in this directory.

f)  ERROR directory:  if NWRWAVES crashes for any reason, the core dump of the tcl/tk interpreter, along with a copy of the inbound AWIPS product are placed in this directory.  There is also a file kept in the /awips/adapt/NWRWAVES directory called 'errorout.txt'.  This file will exist, and its size will be zero, if NWRWAVES has run successfully for any product.

**NOTE:**  The contents of these directories are scoured by NWRWAVES every 30 days.  You will have a running 30 day activity log of everything sent into, and that comes out of, NWRWAVES.

**NOTE**: NWRWAVES has robust error trapping capabilities built into the software.  Should NWRWAVES fail, the operational staff will be alerted by a red-banner message (fxaAnnounce) that the program failed, and they will be directed as to why it failed.  Examples of some common failure conditions include: expired UGC time in a product, corrupt product configuration file (hand editing), and corrupt VTEC or UGC lines (hand editing).  If a product fails to transmit, sites will at least be able to recognize what didn't process, then take appropriate action to ensure that the data is broadcast.

6)  When 'nwrwaves.tcl' has finished, it will take appropriate action with its output file(s) for CRS.  If you called this file with the 'nwrwavestest.csh' file, all output files will be copied to the /awips/adapt/NWRWAVES/TEST directory.  If you used the 'nwrwaves.csh' file, then the output will be copied to one of two locations:

a)  If your transmission status is set to "CRS" for this NWRWAVES product type, the output will be copied to the '/data/fxa/workFiles/nwr/ready' directory.  Baseline AWIPS processes that monitor this directory will then take the output files and send them to CRS.

b)  If your transmission status is set to "Pending" for this NWRWAVES product type, the output will be copied to the '/data/fxa/workFiles/nwr/pending' directory.  They will appear in the 'Pending' side of the NWRWAVES Browser.  Manual intervention through the browser will be required to send the output to CRS.

A complete listing of the NWRWAVES file structure is included in Appendix A.

## 8.    WORD/PHRASE REPLACEMENT CAPABILITY

The use of the Voice Improvement Processor (VIP) pre-processor and dictionary capabilities is encouraged to handle most word replacements, but there are some instances where you may want to make corrections before a product is transmitted to CRS.  A number of such features are already built into NWRWAVES, including the correction of punctuation, removal of ellipses, etc.   However a **WordFile.txt** file is provided with NWRWAVES. Instructions are provided at the top of this file, along with a number of examples within.

To modify the word replacement file:
1) Open a shell on any AWIPS workstation, with a user account that has 'fxalpha' group privileges.
2) Type **cd /awips/adapt/NWRWAVES/bin**.
3) Type **gedit /awips/adapt/NWRWAVES/bin/WordFile.txt**.
4) Add any words or phrases that you want in the prescribed format.
5) **Save** and **exit** from the editor when you are done
6) Close the active shell.

Some hints and guidelines as to the structure of this file (**NOTE:** it is similar to the CAFÉ WordFile.txt file. You should be able to easily port any local changes you have made there into NWRWAVES):

a) Use a double pipe (‖) to separate the original string from the replacement string.
b) All white space will be ignored.
c) Do not use punctuation in the original phrase. NWRWAVES will automatically replace the original phrase even if it is followed by a comma, period, dash, new line or space.
d) Phone numbers do not require any special entries for replacement, if they are included in your AWIPS text products in a traditional phone number format #-###-#### or ###-###-####. These formats will be handled correctly in NWRWAVES. If a site formats phone numbers differently in their actual text products, it may not be necessary to do so anymore, as they might get unexpected results.
e) Related to (d), sites that typically use ranges with a dash (NORTH WINDS 7-11 MPH, HIGHS 77-82) will not get correct wording in an outbound CRS product. These ranges will need to be coded up differently in AWIPS text products.
f) For advanced users, the use of regular expressions is allowed and encouraged. Do not surround any regular expressions with quotes or braces {}.

An excellent reference to how regular expressions can be crafted can be found in the black Tcl/Tk Welch Book, "Practical Programming in Tcl and Tk". Pages 121-126 are most insightful. Examples of some common regular expressions are:

**[0-9][0-9][0-9][0-9]Z ‖**

Replaces UGC time references in products such as '1200Z'

**[HPMCEA][DS]T ‖**

For time zone replacement, you can use this regular expression to take out time zone references in a product. In the baseline WordFile.txt, this line is commented out. Uncomment the line (take out the leading # symbol) if you want to filter out all time zones. If your office has multiple time zones, you may want to modify this to take out the most common one (i.e., take out C in the first bracketed area to mention Central Daylight/Standard Time but mention Mountain Time.

**SEE LAKE ONTARIO OPEN LAKES FORECAST FOR [^/n]+ ‖**

This is an example of how to code up a replacement for a common phrase, where wording may vary at the end such as the end of the week. The following phrase might be commonly found in a Near Shore Forecast: SEE LAKE ONTARIO OPEN LAKES FORECAST FOR FRIDAY THROUGH THURSDAY.

g) Do not duplicate entries here with those that already exist in your VIP dictionary. This file is ideal for overriding CRS generalities such as:
- FT to be read as FEET
- Stripping the time zones off of time stamps in products (see (d) above)
- Pausing long phrases

# 9.  LESSONS LEARNED AND RESOURCES AVAILABLE

An NWRWAVES resource web site has been created for support purposes. This site is located under the CRS web site maintained by NWS Headquarters (http://www.weather.gov/ops2/crs/nwrwaves.htm). This web site contains an FAQ list, various documentation for NWRWAVES, and a link to the NWRWAVES listserver.

NWRWAVES support will be administered through the NWRWAVES listserver. The initial software development team includes Evan Bookbinder (Lead Forecaster, WFO Pleasant Hill, MO), Brian Walawender (ITO WFO Topeka, KS) and Mike Hudson (Warning Coordination Meteorologist, WFO Pleasant Hill, MO). There are also ten beta test sites (WFO's Huntsville, AL; Morristown, TN; Morehead City, NC; Pittsburgh, PA; Springfield, MO; Paducah, KY; La Crosse, WI; Dodge City, KS; Billings, MT; Monterey, CA) that also have considerable experience with the software.

The best mechanism for support is as follows:
a. Check your problem against the FAQ list on the NWRWAVES web site. If your problem has been encountered before, you will find the solution posted here.
b. If the problem is not readily visible on the FAQ list, post your problem to the list server. This way, everyone who has been working with the software can see your situation, and you can get help from other NWRWAVES users (and the programmers). Operational questions, potential trouble ticket items, problems and questions should be submitted to the NWRWAVES list server to ensure the quickest response possible.
c. As a last resort, phone calls to the development for urgent help can be utilized, but bear in mond staff availability is contingent on local weather conditions and schedule.

Full-time support for NWRWAVES will transition to the NCF (as NWRWAVES is a baseline program) once OB6 is fully deployed across the NWS. After your site has loaded OB6, any problems you encounter in NWRWAVES should be reported to the NCF, so that a trouble ticket can be opened, then elevated as necessary to fix the problem. **NOTE**: do not call the NCF for NWRWAVES support unless you have OB6 loaded on your AWIPS!

To sign up for the NWRWAVES list server, go to the following URL: http://infolist.nws.noaa.gov/read/login/ Input your e-mail address and e-mail password, then select the All Forums Tab. Scroll down to NWRWAVES and click on subscribe. You will receive information back from the listserver concerning use of the forum

# APPENDIX A – COMPLETE NWRWAVES FILE LISTING

```
MAIN INSTALL DIRECTORY LISTING


drwxrwxrwx   2 fxa      fxalpha        4096 Aug 18 15:58 BACKUP
drwxrwxr-x   2 fxa      fxalpha        4096 Aug 12 15:46 bin
drwxrwxr-x   2 fxa      fxalpha        4096 Aug 11 21:35 browser
drwxrwxrwx   2 fxa      fxalpha        4096 Aug 16 18:47 DEBUG
drwxrwxrwx   2 fxa      fxalpha        4096 Aug 11 21:30 ERROR
-rw-rw-r--   1 fxa      fxalpha           0 Aug 10 15:24 errorout.txt
-rw-rw-r--   1 fxa      fxalpha           0 Aug 18 16:21 filelist.txt
drwxrwxrwx   2 fxa      fxalpha        4096 Aug 16 18:47 INPUT
drwxrwxrwx   2 fxa      fxalpha        4096 Aug 16 18:47 LOGS
-rw-rw-r--   1 fxa      fxalpha          18 Aug 10 15:24 NONVTECMRD.txt
-rwxrwxr-x   1 fxa      fxalpha        2908 Aug 12 19:08 nwrwaves.csh
-rwxrwxr-x   1 fxa      fxalpha        1026 Aug 10 15:24 NWRWAVESpurge.sh
-rwxrwxr-x   1 fxa      fxalpha      175414 Aug 17 18:14 nwrwaves_setup.tcl
-rwxrwxr-x   1 fxa      fxalpha      113997 Aug 16 18:48 nwrwaves.tcl
-rwxrwxr-x   1 fxa      fxalpha        2913 Aug 12 19:08 nwrwavestest.csh
drwxrwxrwx   2 fxa      fxalpha        4096 Aug 16 18:47 OUTPUT
-rw-rw-rw-   1 fxa      fxalpha       13643 Aug 15 18:53 product.cfg
drwxrwxr-x   2 fxa      fxalpha        4096 Aug 16 18:48 QUEUE
-rwxrwxr-x   1 fxa      fxalpha        1467 Aug 10 15:24 removeExpiredNWR.sh
drwxrwxrwx   2 fxa      fxalpha        4096 Aug 16 18:47 SUMMARY
drwxrwxrwx   2 fxa      fxalpha        4096 Aug 16 18:47 TEST
-rw-rw-r--   1 fxa      fxalpha        6964 Aug 18 16:00 whatsnew.txt


NWRWAVES bin DIRECTORY LISTING


-rwxrwxr-x   1 fxa      fxalpha        9039 Aug 10 15:29 clocktime.tcl
-rwxrwxr-x   1 fxa      fxalpha       15090 Aug 10 15:29 color_msgbox.tcl
-rwxrwxr-x   1 fxa      fxalpha       64430 Aug 10 15:29 combobox.tcl
-rwxrwxr-x   1 fxa      fxalpha        2211 Aug 10 15:29 dialog.tcl
-rwxrwxr-x   1 fxa      fxalpha        5104 Aug 12 16:09 notebook.tcl
-rwxrwxr-x   1 fxa      fxalpha         923 Aug 10 15:29 pkgIndex.tcl
-rwxrwxr-x   1 fxa      fxalpha        1545 Aug 10 15:29 relinkNWRWAVESBrowser.sh
-rw-rw-r--   1 fxa      fxalpha      227885 Aug 15 18:50 UGClookup.table
-rwxrwxr-x   1 fxa      fxalpha       23738 Aug 10 15:29 UGC_VTEC_Decoder.tcl
-rwxrwxr-x   1 fxa      fxalpha        3006 Aug 17 17:59 WordFile.txt


NWRWAVES BROWSER DIRECTORY LISTING


-rw-r--r--   1 fxa      fxalpha          40 Aug 10 15:30 admin.list
-rw-rw-r--   1 fxa      fxalpha        1118 Aug 10 15:30 browser.cfg
-rw-rw-r--   1 fxa      fxalpha         267 Aug 10 15:30 browser.ini
-rwxrwxr-x   1 fxa      fxalpha       61550 Aug 17 18:42 browser.tcl
-rw-rw-r--   1 fxa      fxalpha          82 Aug 10 15:30 editors.cfg
-rw-rw-r--   1 fxa      fxalpha          91 Aug 10 15:30 pils.list
-rwxrwxr-x   1 fxa      fxalpha       12788 Aug 10 15:30 update.tcl
```

# APPENDIX B – EXAMPLE OF EAX siteTrigger.template FILE FOR NWRWAVES

```
STLSVREAX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLSVRLSX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLSVRSGF   /awips/adapt/NWRWAVES/nwrwaves.csh
TOPSVRTOP   /awips/adapt/NWRWAVES/nwrwaves.csh
DSMSVRDMX   /awips/adapt/NWRWAVES/nwrwaves.csh
CHISVRDVN   /awips/adapt/NWRWAVES/nwrwaves.csh
OMASVROAX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLTOREAX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLTORLSX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLTORSGF   /awips/adapt/NWRWAVES/nwrwaves.csh
TOPTORTOP   /awips/adapt/NWRWAVES/nwrwaves.csh
DSMTORDMX   /awips/adapt/NWRWAVES/nwrwaves.csh
CHITORDVN   /awips/adapt/NWRWAVES/nwrwaves.csh
OMATOROAX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFWEAX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFWLSX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFWSGF   /awips/adapt/NWRWAVES/nwrwaves.csh
TOPFFWTOP   /awips/adapt/NWRWAVES/nwrwaves.csh
DSMFFWDMX   /awips/adapt/NWRWAVES/nwrwaves.csh
CHIFFWDVN   /awips/adapt/NWRWAVES/nwrwaves.csh
OMAFFWOAX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFAEAX   /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFALSX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFASGF      /awips/adapt/NWRWAVES/nwrwaves.csh
TOPFFATOP      /awips/adapt/NWRWAVES/nwrwaves.csh
DSMFFADMX      /awips/adapt/NWRWAVES/nwrwaves.csh
CHIFFADVN      /awips/adapt/NWRWAVES/nwrwaves.csh
OMAFFAOAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFSEAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFSLSX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFFSSGF      /awips/adapt/NWRWAVES/nwrwaves.csh
CHIFFSDVN      /awips/adapt/NWRWAVES/nwrwaves.csh
DSMFFSDMX      /awips/adapt/NWRWAVES/nwrwaves.csh
TOPFFSTOP      /awips/adapt/NWRWAVES/nwrwaves.csh
OMAFFSOAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFLWEAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFLWLSX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFLWSGF      /awips/adapt/NWRWAVES/nwrwaves.csh
CHIFLWDVN      /awips/adapt/NWRWAVES/nwrwaves.csh
TOPFLWTOP      /awips/adapt/NWRWAVES/nwrwaves.csh
OMAFLWOAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFLSEAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFLSLSX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLFLSSGF      /awips/adapt/NWRWAVES/nwrwaves.csh
CHIFLSDVN      /awips/adapt/NWRWAVES/nwrwaves.csh
TOPFLSTOP      /awips/adapt/NWRWAVES/nwrwaves.csh
OMAFLSOAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLWSWEAX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLWSWLSX      /awips/adapt/NWRWAVES/nwrwaves.csh
TOPWSWTOP      /awips/adapt/NWRWAVES/nwrwaves.csh
OMAWSWOAX      /awips/adapt/NWRWAVES/nwrwaves.csh
CHIWSWDVN      /awips/adapt/NWRWAVES/nwrwaves.csh
DSMWSWDMX      /awips/adapt/NWRWAVES/nwrwaves.csh
STLWSWSGF      /awips/adapt/NWRWAVES/nwrwaves.csh
```

```
TOPCEMTOP        /awips/adapt/NWRWAVES/nwrwaves.csh
STLCEMSGF        /awips/adapt/NWRWAVES/nwrwaves.csh
STLCEMEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLCEMLSX        /awips/adapt/NWRWAVES/nwrwaves.csh
DSMCEMDMX        /awips/adapt/NWRWAVES/nwrwaves.csh
OMACEMOAX        /awips/adapt/NWRWAVES/nwrwaves.csh
CHICEMDVN        /awips/adapt/NWRWAVES/nwrwaves.csh
STLNOWEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLNOWLSX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLNOWSGF        /awips/adapt/NWRWAVES/nwrwaves.csh
CHINOWDVN        /awips/adapt/NWRWAVES/nwrwaves.csh
DSMNOWDMX        /awips/adapt/NWRWAVES/nwrwaves.csh
TOPNOWTOP        /awips/adapt/NWRWAVES/nwrwaves.csh
OMANOWOAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLNPWEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLNPWLSX        /awips/adapt/NWRWAVES/nwrwaves.csh
CHINPWDVN        /awips/adapt/NWRWAVES/nwrwaves.csh
DSMNPWDMX        /awips/adapt/NWRWAVES/nwrwaves.csh
OMANPWOAX        /awips/adapt/NWRWAVES/nwrwaves.csh
TOPNPWTOP        /awips/adapt/NWRWAVES/nwrwaves.csh
STLNPWSGF        /awips/adapt/NWRWAVES/nwrwaves.csh
STLPNSEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLRNSEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLHWOEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLSPSEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
STLRWSEAX        /awips/adapt/NWRWAVES/nwrwaves.csh
```